



MONITORING OF RECOVERING DUNE HEATH AT ØSTERILD 2019

Part 4

Technical Report from DCE – Danish Centre for Environment and Energy No. 175 2020



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Data sheet

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Abstract: The conifer trees in a part of Østerild Klitplantage have been clear-cut to provide room for a national test center for large wind turbines. Before the afforestation DCE has performed a baseline monitoring in the summer of 2011. DCE has in summer 2019 re-monitored the recovery of the vegetation cover to elucidate the direction and the rate of succession in 76 plots. The afforestation has led to the spread of light-demanding, low-growing vegetation dominated by dwarf shrubs and especially some species of grasses. Besides, in the 76 plots 122 vascular plant taxa have been recorded.

Keywords: Østerild Klitplantage, monitoring, vegetation cover, vegetation composition, shifting dune vegetation, grey dune, moist dune heath, dune slack, vegetation analysis, pinpoint analysis, documentary circle, wind turbine.

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Summary

The state-owned Østerild area, including the afforested plantations Østerild Klitplantage and the neighbouring Hjardeådal Plantage, is located in Thy region in the northern part of Jutland in Denmark. The dominant tree species in the Østerild area are conifers that mainly are the introduced alien species *Picea sitchensis* (Sitka Spruce) and *Pinus mugo* (Mountain Pine) together with the original native species *Pinus sylvestris* (Scots Pine) which has been planted here.

The three species were the main conifers present in the afforested areas where the National Test Centre facility for wind turbines was established in 2011 and inaugurated in 2012. The assumption was that the starting conditions before the clear-cutting in summer 2011 would have a major impact on the succession following deforestation.

Prior to afforestation in the late 18th and in the beginning of the 20th century, the dune areas in the Østerild area were characterised by a high-level, presumably fluctuating, water table. Consequently, moist and wet habitats were widespread as most of the area was and still is low-lying.

Therefore, successful regeneration of moist dune heaths and humid dune slacks (habitat type 2190) required recovery of the original hydrological regime. Thus, one of the implemented initiatives was to close drainage ditches and allow temporary pools and shallow waterbodies to develop or expand. Besides, various treatments of accumulated soil organic matter were planned in order to facilitate the recovery of the vegetation cover of grey dunes (habitat type 2130), dry dune heath (habitat type 2140), and the above mentioned moist habitat types. One of the aims in planning the monitoring program was to follow the succession in dry and moist dune habitats, including areas with seasonal flooding.

Aarhus University, Danish Centre for Environment and Energy (DCE), has developed the botanical monitoring program in 2011 prior to the clear-cutting of the conifer trees. The overall objective of the monitoring program running from 2011 to 2021 is to document the direction of the recovery of light-open dune habitats after the clear-cutting of the dune plantations in the Østerild area in 2011.

In accordance with the objective of the monitoring program, twelve monitoring sites were established in stands of the three main coniferous species. Hundred plots were appointed in the monitoring sites following a stratified random design in order to span the different times of planting of the different conifer stands and the applied regeneration measures. The baseline condition (forest type), the planned post-cutting treatments of the remaining stumps and the litter layer, the hydrology, the expected management regimes, the distance to appropriate seed sources, and the topography of the Østerild area were important parameters for the stratification. Thus, 20 plots were placed in the *P. mugo*, 30 in the *P. sylvestris* and 50 in the *P. sitchensis* stands.

Within the framework of the monitoring program, the first phase was to record the species diversity, the vegetation composition, and the soil condition prior to the clear-cutting of the dune plantations (the baseline monitoring). The next phase involved a systematic recording of the development of the vegetation composition and soil conditions (the post-construction monitoring) during the first 10 years after the clear-cutting in order to follow the

changes from the baseline conditions towards recovery of light-open dry and moist dune habitats.

One of the objectives of the monitoring program was to assess the effect of the treatments on the rate and direction of vegetation development towards the target communities. Unfortunately, not all the planned treatments were implemented while the need for the clear-cutting of the afforested areas have had a lesser extent than originally planned causing that the trees in one monitoring site with plots investigated in 2011 have not been cut. Therefore, in 2017 thirty-five new plots were laid out in other parts of the clear-cut plantation areas of which five were placed close to the main unpaved field road of the Test Centre, partly covering the verge. None of the plots had been investigated previously neither in the baseline monitoring in 2011 nor in the preceding years.

Between 2017 and 2019, the establishment of a new telecommunication mast with its associated anchorage and the construction of an unpaved access road to the mast area from the existing main field road of the Test Centre have destroyed the three plots no. 32, 34 and 62. Besides, no. 31 and 35 have been heavily affected by the construction of the anchorage bases. A sixth plot, no. 17, was accidentally buried under a pile of wooden flakes. Thus, there are 96 plots left for the final investigation in 2021 of the development of the vegetation composition caused by the various treatments after the clear-cutting of the plantation in 2011.

In August 2019, DCE investigated the remaining 41 plots established in 2011 and the 35 new plots established in 2017. In accordance with the monitoring scheme, the 20 plots laid out in the former *Pinus mugo* stand in Hjärdemål Plantage were not investigated in 2019. A pinpoint frame (0.5 * 0.5 m²) and a documentation circle with a radius of 5 m where the pinpoint frame function as the centre were used to investigate the composition of the plant species and vegetation structure in each of the 76 plots. The plots were recovered by the use of a GPS and the digital photos taken in 2017.

Within the pinpoint frame, all vascular plant species, bryophytes, and lichens were recorded and then supplemented with additional species in the rest of the 5 m circle. Besides, within the 5 m circle the total coverage area of bryophytes, lichens, bare soil and sand, the amount of dead wood, and the free water surface were estimated. The height of the vegetation cover within the pinpoint frame and general inclination of the plot were measured. An overall digital photo was taken of all of the 76 plots. All vascular plant species and some characteristic bryophytes and lichens were determined on the species level in the field. All collected data were immediately recorded on the field scheme. The names of the species, their presence in the pinpoint frame or in the 5 m circle, all the additional data, and the digital photos are compiled in the annexes of the report.

During the fieldwork in 2019, 122 vascular plant taxa were recorded in the 76 plots – 67 dicots and 34 monocots, including 16 grasses, and 9 sedges and rushes, respectively. Gymnosperms contributed with two species, and ferns and fern allies with three species. The cryptogam flora included nine determinable taxa of bryophytes and two lichen taxa.

Species richness varied widely between the 76 plots. Nine taxa were the absolute minimum number recorded in two plots in the former *Pinus sylvestris* and *Picea sitchensis* stands, respectively. The highest number of 39 taxa was recorded in a

plot adjacent to the main unpaved field road where *Picea sitchensis* previously formed the canopy. In the former *Pinus sylvestris* stands the highest number of recorded in a plot was 30 taxa while in the former *Picea sitchensis* stands 23 taxa in a plot were the highest number. In the area where *Pinus mugo* previously dominated the lowest and the highest number in the plots were 14 and 21 taxa.

The dwarf shrub *Calluna vulgaris* was the most widespread species recorded in 97 % of the plots followed by the grasses *Molinia caerulea* and *Avenella flexuosa*, which were present in 89 % and 82 % of the plots, respectively. Other common species were the dwarf shrub *Erica tetralix*, the broadleaved herbs *Hypochaeris radicata* and *Rumex acetosella*, and the grasses *Agrostis capillaris* and *Holcus lanata*, although the two latter were not recorded in any of the 10 plots in the former *Pinus mugo* stand. *Juncus effuses* was the most widespread rush recorded in more than two-thirds of the plots while the most widespread fern species was *Dryopteris carthusiana*. Among the bryophytes, *Dicranum scoparium* and the invasive *Campylopus introflexus* were the most widespread species. The mean number of taxa per plot was 20.

The species quoted above were also the most widespread as the majority were found at all monitoring sites. *Carex arenaria* was an exception by not being found in any of the five plots along the main unpaved field road. The influence of the main unpaved field road on the species composition was obvious. In the five verge plots, nineteen species were more frequently or exclusively recorded in the vegetation cover.

The clear-cutting of trees in the project area has led to exposure of the bottom layer. The improved light penetration to the bottom layer has facilitated the spread of vascular plants, bryophytes, and lichens to the former afforested areas. Especially dwarf shrubs like *Calluna vulgaris*, *Empetrum nigrum*, *Erica tetralix*, and *Vaccinium uliginosum* and a number of prominent grass species like *Agrostis capillaris*, *Avenella flexuosa*, *Holcus lanatus*, and *Molinia caerulea* have benefitted from the improved light conditions. Besides, the 2019 investigation revealed the presence of two invasive alien species, *Amelanchier spicata* and *Prunus serotina*, not previously recorded in the plots.

In the plots, eighteen new common vascular plant species have been recorded presumably occurring in the surroundings of the National Test Centre. For instance, the establishment of the new telecommunication mast with its additional infrastructure in one monitoring site may have led to their presence because of the disturbance the construction activities have caused e.g. the construction of the access road paved with gravel and transport of building material.

The prime objective of the clear-cutting of the former afforested areas in the project area was besides the establishment of the National Test Centre to try to direct the vegetation succession on areas not directly affected by the erection of the wind turbine facilities towards the target communities – dry and wet heathland and dune slacks. Secondly, the botanical project aims to improve the diversity of native species compared to the situation before the deforestation of the project area by creating suitable habitats for light-preferring, low-growing species with preference for nutrient-poor conditions, fluctuating water table, and shifting moisture regime. Whether the overall objective of the project has been successful must await the performance of a more in-depth analysis of all the gathered vegetation and additional data after the completion of the vegetation monitoring in 2021.

Sammenfatning

Det danske Folketing vedtog i 2010, at der skulle etableres et nationalt testcenter for afprøvning af store vindmøller. Valget faldt på Thy, hvor dele af de statsejede Østerild Klitplantage og Hjardemål Plantage indgik i planerne. Forud for anlægsarbejdets igangsættelse blev der udarbejdet en implementeringsplan (Danmarks Miljøundersøgelser & Miljøministeriet 2010). Planen beskriver bl.a. testcentrets udformning og drift, rydning af skov, forvaltningsmodeller for naturtyper og modellernes implementering. For at kunne opføre testcenteret skulle træerne ifølge planen fældes i dele af plantageområderne. Det drejede sig om nåletræsområder beplantet med den hjemmehørende skov-fyr (*Pinus sylvestris*) samt de indførte bjerg-fyr (*Pinus mugo*) og sitka-gran (*Picea sitchensis*). Træerne i de udpegede plantageområder blev fældet i juli og august 2011. Da det viste sig, at behovet for plads til testcenteret var mindre end forudsat i implementeringsplanen (Danmarks Miljøundersøgelser & Miljøministeriet 2010), blev færre træer fældet.

Plantageområderne administreres af Naturstyrelsen Thy. I forbindelse med vedtagelsen af lovforslaget om etablering af et nationalt testcenter for vindmøller ved Østerild i Thy blev det besluttet at følge vegetationsudviklingen på de ryddede arealer, som ikke direkte er indgået i de arealer, der benyttes af vindmøller med tilhørende telemaster og til anlæg af forbindelsesveje til de tekniske installationer. Ved at gennemføre forskellige tiltag i form af genindførsel af græsning, ændring af grundvandsstanden og etablering af lavvandede, til- og afløbsløse vandhuller samt forskellige typer af behandling af førnelaget og de efterladte træstubbe undersøges mulighederne for, at tidligere tiders klitlandskab kan genskabes på de tilstødende arealer, der er blevet afskovet.

Det Nationale Center for Miljø og Energi under Aarhus Universitet (DCE) har i 2011 efter aftale med Naturstyrelsen Thy udarbejdet et botanisk overvågningsprogram. Det overordnede formål med programmet er at dokumentere vegetationsdækkets succession mod lysåbne og mere artsrige klitnaturtyper efter rydningen af nåletræsbevoksninger i det nationale testcenter. Overvågningsprogrammet omfattede en registrering af jordbundsforhold, vegetationsstruktur og artssammensætning, før træerne blev fældet (baseline overvågning), og en systematisk registrering af vegetationsændringerne gennem de første 10 år af successionen mod lysåbne klit-naturtyper.

I 2011 blev 12 overvågningsstationer udpeget og 100 prøvefelter udlagt heri. Prøvefelterne var stratificeret tilfældigt med henblik på at dække variationen i udgangspunktet for vegetationsudviklingen og de behandlinger, der blev skitseret i implementeringsplanen (Danmarks Miljøundersøgelser & Miljøministeriet 2010). Stratificeringen omfattede udgangspunktet (skovtype), de planlagte behandlinger af førne og hydrologi, forventet pleje og drift af den lysåbne klitnatur, afstand til egnede spredningskilder og områdets topografi. Det blev antaget, at udgangspunktet havde stor betydning for successionen efter skovrydningen, og at overvågningsstationerne derfor omfattede de berørte bevoksninger med sitka-gran, bjerg-fyr og skov-fyr.

Koordinaterne for de 100 prøvefelter var forlods blevet uploadet i en GPS. Ved hjælp af GPS'en blev prøvefelterne fastlagt i felten. Det ene hjørne af en pinpoint ramme blev anbragt så præcist som muligt i centrum af prøvefeltet. Dette hjørne blev defineret af rammens sydvestlige hjørne og dens sider blev orienteret ved hjælp af et kompas efter verdenshjørnerne. En snor på fem meter blev trukket mod syd, hvorfra der blev taget et digitalt oversigtsfoto af prøvefeltet

med pinpoint rammen i centrum i en passende afstand fra enden af 5 m snoren, så prøvefeltet blev dækket bedst muligt af hensyn til fremtidig genfinding.

Pinpoint rammen måler 0,5 x 0,5 m² og rummer 16 analysepunkter markeret ved krydsningspunkterne for de to gange fire, parallelt udspændte snore fra rammens modstående sider. Vegetationsanalysen starter i krydsningspunktet tættest på rammens nordvestlige hjørne. Næste punkt er krydsningspunktet mod øst og så fremdeles til det 16. krydsningspunkt i rammens sydøstlige hjørne. En slank, stiv metalpind føres lodret gennem vegetationsdækket og alle levende plantedele af karplanter, mosser og laver, pinden berører, artsbestemmes og noteres på feltskemaet. Bliver ingen plantedele berørt, noteres det, om underlaget er bar jord, bart sand, førne, dødt ved, ekskrementer eller åbent vand. Arealet under rammen bliver dernæst afsøgt for supplerende arter, der noteres særskilt på feltskemaet.

Den gennemsnitlige vegetationshøjde måles i hvert af rammens fire hjørner startende i det nordvestlige og sluttende i det sydøstlige efter retningslinjerne i den tekniske anvisning for overvågning af terrestriske naturtyper (Fredshavn et al. 2011). Rammens og dermed underlagets hældning centralt i prøvefeltet måles ved hjælp vinkelmåleren i kompasset ved at anbringe dette på rammens overside og aflæse vinklen.

Dernæst gennemtraves 5 m-cirklen med uret fra syd i radierende baner fra pinpoint rammen langs den udspændte snor og tilbage igen indtil alle 78 m² er blevet undersøgt. Alle arter, der ikke allerede er blevet registreret indenfor pinpoint-rammen artsbestemmes og noteres særskilt på feltskemaet. Under gennemtravningen vurderes fladedækningen af mosser, laver, dødt ved, nøgen jord, nøgent sand og åbent vand. Alle karplanter er sammen med karakteristiske mosser og laver blevet artsbestemt i felten. Ubestemte mosser og laver er noteret i en af kategorierne 'Bladmossier, Levermossier, Bæger- eller rensdyrlaver, Rensdyrlaver og Bægerlaver'. Feltarbejdets resultater er samlet i bilag 1-6 bagerst i rapporten.

I 2019 blev 42 af de oprindeligt 100 prøvefelter analyseret. Som følge af manglende opfølgning på nogle af de oprindeligt planlagte plejetiltag og den reducerede afskovning blev 35 nye prøvefelter udlagt og analyseret i 2017 og genanalyseret i 2019. De blev fordelt med to gange femten prøvefelter i to ryddede områder, der førhen var bevokset med henholdsvis bjerg-fyr, skov-fyr og sitka-gran. Fem prøvefelter blev udlagt langs hovedforbindelsesvejen til møllerne, så 5 m cirklen dækkede vejkanten for at belyse vejanlæggets indflydelse på vegetationsudviklingen og dens artsbidrag. Her var der tidligere plantet sitka-gran. De 20 nordlige prøvefelter, hvor der tidligere var plantet bjerg-fyr, og som blev undersøgt i 2013, 2015 og 2017, blev i overensstemmelse med overvågningsprogrammet ikke analyseret i 2019.

Som følge af opførelsen af en ny mast, dens tilhørende støbte forankringer af støttewirerne og etablering af en tilkørselsvej fra testcentrets hovedforbindelsesvej til pladsen omkring masten blev tre prøvefelter ødelagt, mens to prøvefelter blev stærkt påvirket af anlægsarbejde. En større bunke træflis havde begravet et sjette prøvefelt. Af de oprindeligt 100 prøvefelter fra 2017 er der således 96 tilbage til fremtidig analyse af vegetationsudviklingen som følge af de gennemførte behandlingsformer og tiltag i efter renafdriften i 2011.

122 taxa blev registreret ved feltarbejdet i 2019 i de 76 prøvefelter. Heraf repræsenterede 112 taxa dækfrøede karplanter fordelt på 67 taxa af tokimbla-

dede og 34 enkimbladede. Sidstnævnte omfattede 16 arter af græs, 9 halvgræsarter og 9 siv- og frytlearter. Der blev registreret 2 nåletræsarter, mens karsporeplanterne bidrog 3 arter. Der blev registreret 9 arter af mosser og 2 laver af de arter, det var muligt at bestemme i felten.

Artsdiversiteten varierede meget de 76 prøvefelter imellem. Det absolutte minimale antal på 9 taxa blev registreret i to prøvefelter, hvor der tidligere stod henholdsvis skov-fyr og sitka-gran. Det højeste antal på 39 taxa blev registreret i et prøvefelt ved siden af testcentrets hovedforbindelsesvej. Det højeste antal i et prøvefelt tidligere beplantet med skov-fyr var 30 taxa, mens det højeste antal i de tidligere sitka-gran beplantninger var 23 taxa. Det højeste og laveste antal i prøvefelter i området førhen domineret af bjerg-fyr var henholdsvis 21 og 14 taxa.

Dværgbusken hedelyng (*Calluna vulgaris*) var den mest udbredte art, idet arten blev registreret i 97 % af prøvefelterne. Græsserne bølget bunke (*Avenella flexuosa*) og blåtop (*Molinia caerulea*) var de næstmest udbredte arter. Andre udbredte arter var dværgbusken klokkeling (*Erica tetralix*), de bredbladede urter almindelig kongepen (*Hypochaeris radicata*) og rødknæ (*Rumex acetosella*), græsserne fløjlgræs (*Holcus lanatus*) og almindelig hvene (*Agrostis capillaris*) samt lyse-siv (*Juncus effusus*). Af bregner var smalbladet mangeløv (*Dryopteris carthusiana*) mest udbredt. Blandt mosser var kost-kløvtand (*Dicranum scoparium*) og den invasive stjerne-bredribbe (*Campylopus introflexus*) mest udbredt. Det gennemsnitlige antal taxa i prøvefelterne var 20.

Tilstedeværelsen af hovedforbindelsesvejen har sat sit aftryk på artssammensætningen, da der i de fem prøvefelter er blevet registreret 19 arter, som er de mest udbredte her eller kun forekommer her.

Renafdriften af skovtræerne medførte, at de tidligere plantageområders bundlag blev blottet. Det bevirkede, at en række karplanter, mosser og laver spredte sig på den blottede jordbund som følge af den øgede mængde lys og den øgede næringstilgængelighed samt de iværksatte behandlings- og plejetiltag. Det fremmede i første række dværgbuske som hedelyng, revling, klokkeling og mose-bølle, ligesom flere markante græsser, almindelig hvene, bølget bunke, fløjlgræs og blåtop drog fordel af rydningen. 2019 undersøgelsen dokumenterede forekomsten af to ikke førhen registrerede invasive arter, nemlig aks-bærmispel (*Amelanchier spicata*) og glansbladet hæg (*Prunus serotina*).

Der er blevet registreret 18 almindelige arter, der formodentlig forekommer i nabolaget, og som ikke er blevet registreret i prøvefelterne før. Deres fremkomst kan blandt andet skyldes forstyrrelse af vegetationsdækket og blotlægning af jordbunden, som opførelsen af den nye radiomast medfører med tilhørende forankring, etablering af en med grus befæstet tilkørselsvej og transport af byggematerialer.

Den biologiske målsætning med renafdriften af de tidligere nåletræsbeplantede områder er et forsøg på at genskabe de lysåbne og fugtige klitnaturtyper ved hjælp af den naturlige vegetations udvikling på de arealer, der ikke direkte er omfattet af opførelsen af vindmøller og de dertil knyttede tekniske installationer og vej anlæg. Samtidig er der et ønske om en forøgelse af diversiteten af naturligt forekommende plante- og dyrearter, der er afhængige af et fluktuerende grundvandslag og ændret jordbundsfugtighed i forhold til, da områderne var trædækkede. Om den samlede målsætning er lykkedes, må afvente en samlet analyse af den totale mængde af vegetations- og strukturdata efter, at den samlede overvågningsperiode afsluttes i 2021.

1 Background

The Danish Parliament decided in 2010 the establishment of a National Test Centre for experimental testing of tall wind turbines. The Østerild area in the Thy region in Northern Jutland was appointed as location for the Test Centre. An implementation plan (Danmarks Miljøundersøgelser & Miljøministeriet 2010) was worked out before the onset of the establishment of the Test Centre. The plan describes, among other issues, the design and operation of the Test Centre, clear-cutting of parts the plantations, monitoring models for habitat types, and implementation of the model.

Most of the National Test Centre area is located at a rather low altitude above sea level and on mostly level ground. Topographical variation is restricted to Hjørdemål Platage in the project area, only, where a hilly dune landscape formerly covered with *Pinus mugo* stand occurs (see Nygaard et al. 2011).

The present information on the vegetation composition in the plantations is scant and there is no available data on the state and composition of the vegetation cover before the afforestation of the Østerild area (Wind 1991).

2 Objective

DCE designed a botanical monitoring program at springtime 2011 in order to follow the direction of the vegetation succession after the clear-cutting of a part of the plantation in the Østerild area as stated in the implementation plan (Danmarks Miljøundersøgelser & Miljøministeriet 2010). The botanical monitoring program has a dual purpose of assessing and quantifying the importance of site conditions and post-construction treatments for successful development towards natural light-open and moist dune communities and generating evidence-based knowledge of the direction of the vegetation development.

The overall objective of the botanical monitoring program is to describe the direction of the vegetation succession and to gain evidence of the rate of vegetation recovery in the project area of the National Test Centre. The Test Centre was established in parts of the state-owned plantations Østerild Klitplantage and Hjørdemål Plantage, formerly afforested with various species of conifer trees. The deforested area excluding the areas with wind turbines, telecommunication masts, and other infrastructure is termed *the project area* in the present report.

The establishment of the plantation in the Østerild area commenced relatively late compared with the afforestation of other coastal dune areas in Denmark. The primary aim of conifer planting was to hamper sand drift and, secondarily, for producing timber and firewood. Geologically most of the area was raised sea bottom from the Stone Age, shaped by land uplift and shifting sand. The afforestation of Østerild Klitplantage began in 1889 (Naturstyrelsen 2012), while the planting of trees in Hjørdemål Plantage north of Østerild Klitplantage took place in the 1930s (Wind 1991).

In summer 2011, the conifer trees in a part of Østerild Klitplantage and Hjørdemål Plantage was clear-cut to give way to the facilities and its associated infrastructure of The National Test Centre. The need for light-open areas proved to be less extensive at the time of establishment of the Centre causing that a larger part of the plantations were left untouched than originally stated in the implementation plan (Danmarks Miljøundersøgelser & Miljøministeriet 2010).

After the clear-cutting, the Danish Nature Agency in Thy introduced different types of management of the deforested areas such as initiating grazing with livestock, closing of drainage ditches in order to raise the ground water level and establishing of shallow water bodies. The aim was to restore light-open habitat types such as grey dune (habitat type 2130), dry and wet dune heath (habitat type 2140), and humid dune slacks (habitat type 2190) by permitting the natural vegetation cover to regenerate from the remaining seed bank and by dispersal of diaspores from neighbouring light-open habitats.

In the Østerild area, a free-living stock of *Cervus elaphus* (red deer) and other herbivores browse the vegetation unlimited. When the animals use the project area, they can create gaps in the vegetation cover by treading and scraping the soil surface and cause the elimination of undesired growth of invasive trees and shrubs by browsing and by scraping their antler clean. Thus, the presence of a deer stock is an important parameter in the management of vegetation cover. However, as the purpose is to assess the change in the vegetation composition caused by the planned management actions, the botanical monitoring program does not include the impact of free-living, grazing animals.

2.1 Target communities

Depending on the local topography and hydrology the clear-cut areas are expected to develop towards various light-open dune communities, listed in Annex I of the Habitats Directive (EU 1992) (Fig. 1):



Figure 1. Target communities of natural vegetation recovery after clear-cutting of coniferous forest in dune landscapes. Left: Hilly dune landscape with grey dune (type 2130) and dry dune heath (in the northern part of the project area, type 2140); middle: wet dune heath with *Calluna vulgaris*, *Molinia caerulea* and *Myrica gale* (type 2140); right: humid dune slacks with *Sphagnum* sp., *Trichophorum cespitosum* and *Narthecium ossifragum* (western part of Tømmerby Kær, type 2190).

1. Fixed coastal dunes with herbaceous vegetation (*grey dune*) (habitat type 2130).
The habitat type consists of light-open, frequently disturbed vegetation cover on acidic, leached, and nutrient poor sand with *Corynephorus canescens* as the most common vascular plant species together with *Carex arenaria*, *Ammophila arenaria* and *Jasione montana*. Occasionally, the vegetation is very rich in cryptogams, particularly *Cladonia* spp.
2. Decalcified fixed dunes with *Empetrum nigrum* (*dune heath*) (habitat type 2140).
A relatively closed dwarf scrub vegetation cover where *Empetrum nigrum* and *Calluna vulgaris* have colonised the dry sandy areas. Dry dune heaths may contain a rich cryptogam flora, particularly *Cladonia* spp. The vegetation colonising moist or wet sandy areas is a closed dwarf scrub vegetation including *Empetrum nigrum*, *Erica tetralix*, *Calluna vulgaris*, *Vaccinium oxycoccos*, *V. uliginosum*, and the shrub *Myrica gale*.
3. Humid dune slacks (habitat type 2190)
Humid and seasonally flooded depressions with pioneer swards, fens and pools on acidic or calcareous sand. The vegetation encompasses many different plant communities depending on moisture, seasonal fluctuations in water level, pH, natural disturbances, and management (Ejrnæs et al. 2006).

The monitoring program aims to follow the direction of succession in areas where the vegetation cover is assumed to develop towards the above-mentioned natural dune communities.

3 Plot and site selection

The biological aim of the implementation plan (Danmarks Miljøundersøgelser & Miljøministeriet 2010) is to direct the vegetation succession in order to re-establish the target communities described in chapter 2.1 in the area formerly afforested with dense conifer plantations. The conifer plantation involved has mainly consisted of the native, but here planted species *Pinus sylvestris* and the exotic species *Picea sitchensis* and *Pinus mugo*. Thus, the botanical monitoring program is designed to follow the effects of the most important site conditions on the rate and direction of vegetation development towards the target communities after the clear-cutting of parts of the dune plantations. Besides, the program aims to follow, compare, and document the vegetation development in both managed and unmanaged areas.

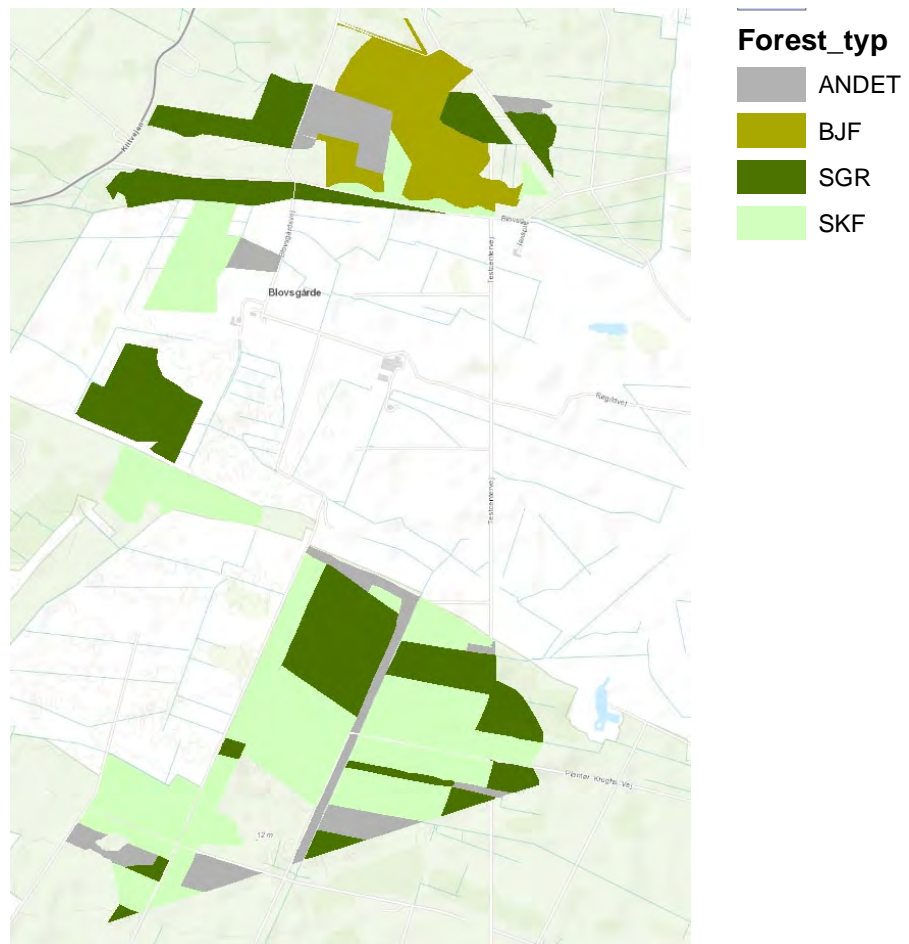
3.1 Forest types

The monitoring sites were placed in coniferous forest stands with *Picea sitchensis*, *Pinus sylvestris*, or *P. mugo* prior to the afforestation. As indicated in the baseline report (Nygaard et al. 2011), the three conifer forest types differed markedly with respect to flora, topography, and soil conditions.

- Approximately 40 % (106 ha) of the area was originally covered with dense coniferous plantations dominated by the introduced species the spruces *Picea sitchensis* and *P. omorica*, the pine *Pinus contorta* and the fir *Abies alba* afforested on former dune heathland. Plantations with *Picea sitchensis*, a species that tolerates seasonally high groundwater levels, covered more than 30 % of the sampling area. During the past decades, a thick layer of organic matter (needles, cones, twigs, and branches) covering the forest floor had led to soil accumulation of atmospheric nitrogen, while the vegetation cover consisted mostly of bryophytes, for instance *Hypnum cupressiforme* and *H. jutlandicum*.
- *Pinus sylvestris* forest covered originally another 40 % (106 ha) of the afforested area. In less dense stands, the understorey consisted of a well-developed dwarf shrub vegetation with *Calluna vulgaris*, *Empetrum nigrum*, *Erica tetralix*, and *Vaccinium uliginosum*.
- *Pinus mugo* stands covered originally 10 % (26 ha) of afforested area and were restricted to the dry, hilly dune landscape in Hjardemål Plantage. The plantation was more diverse and included besides *Picea sitchensis* stands patches with a relatively light-open forest canopy with scattered occurrence of lichens, bryophytes, and dwarf shrubs (Fig. 2).

Deciduous forests with *Quercus robur*, *Fagus sylvatica*, and *Betula* sp. covered 6 % of the afforested area but stands with these species were not included in the monitoring program as they lie outside the project area.

Figure 2. Pre-construction distribution of coniferous forest types in the Østerild National Test Centre facility area. The map shows coniferous forests that were clear-cut from July 2011 to November 2012. Based on GIS-maps from the Danish Nature Agency in Thy.



3.2 Post-cutting treatments

Coniferous litter is acidic with a very slow decomposition rate leading to accumulation of semi-decomposed needles, cones, and twigs on the forest floor. A thick litter layer in the conifer forest may constitute a major constraint to a successful restoration of natural dune habitats (Sturgess & Atkinson 1993).

In traditional forest management, the tree trunks, representing the economic value, are removed, while tree stumps and the litter layer are left behind. If the aim is afforestation, new trees are planted between the stumps in the accumulated litter layer. If the aim is restoration of natural habitat types, the tree stumps and the litter layer have to be removed in order to expose the underlying mineral soil.

In the original implementation plan (Danmark Miljøundersøgelser & Miljøministeriet 2010), four different post-cutting treatments of the tree stumps and the litter layer were suggested in order to study cost-effective restoration of light-open habitat types developing in the clear-cut plantation areas. The four post-cutting treatments are: 1) sod cutting and removal of litter, 2) sod cutting and burning on site, 3) burning and 4) small-scale soil disturbance as well as areas with untreated stumps and litter. When the monitoring program was designed in 2011, the post-cutting treatments of tree stumps and litter layer were expected to include burning in parts of the *Pinus mugo* stand in the hilly dune landscape in the north and burning, sod cutting, and ploughing as well as an untreated control area in a *Picea sitchensis* stand (site 6 in Fig. 5).

The post-cutting treatments implemented after deforestation differed markedly from the original plan and included stump crushing (158 ha), stump removal (56 ha), and depth milling (12 ha). Only the *Pinus mugo* stands, a very small part of a *Picea sitchensis* stand (Null parcel in Fig. 3), and the *Pinus sylvestris* stands in the western part of the project area were left without post-cutting treatments. Consequently, 35 of the original 100 plots were repositioned prior to the 2017 monitoring in order to reflect the implemented treatments.



Figure 3. Implemented post-cutting treatments of trunks and litter in the Østerild National Test Centre facility. Based on GIS-maps from the Danish Nature Agency in Thy. Legend: Udf_Dybdefræsning = depth milling, Udf_Knusning = stump crushing, Udf_Stødrydning = stump removal, Skovningsomraader = clear-cut forest areas, Naal = conifers, Andet = miscellaneous, BJF = *Pinus mugo*, SGR = *Picea sitchensis*, SKF = *Pinus sylvestris*,

3.3 Hydrology

Prior to afforestation in the late 1800s, the dune areas in the Østerild Klitplantage and the Hjørdemål Plantage were characterised by a high and presumably fluctuating water table. Consequently, moist and wet habitats were widespread in the area (Miljøministeriet 2009). Because of intensive drainage prior to afforestation, nutrient-poor wet heathland (habitat type 2140) and dune slacks with mire vegetation (habitat type 2190) were restricted to a few poorly drained, light-open areas.

Successful development towards a natural vegetation cover associated with moist dune heaths (habitat type 2140) and humid dune slacks (habitat type 2190) requires adequate regeneration of the hydrological regime. Thus, restoration of a more natural hydrology, mainly by closing drainage ditches and excavations (Fig. 4), will allow temporary pools and shallow lakes to develop or expand (Danmark Miljøundersøgelser & Miljøministeriet 2010).

The botanical monitoring program aims to follow the development in dry, moist and wet dune habitats as well as seasonally flooded areas. Accordingly, originally 60 plots were established in unaltered dry areas and 40 plots in areas expected to encompass a hydrological gradient from dry to moist or wet conditions (Tab. 1).

Table 1. The nine monitoring sites and their baseline condition (forest type), age of forest stand, post-cutting treatments regarding moisture regime (planned wetlands), grazing, litter layer, and number of plots investigated in the particular year. 0 = no investigation of the plots in the particular year. - The site numbers from the previous monitoring reports are shown in brackets in the first column. * Hilly dune area with great topographically variation. ** Monitoring site appointed and plots laid out in 2017.

Site number (previous number)	Baseline condition (forest type)	Stand age	Post-cutting treatments			Number of plots				
			Moisture	Grazing	Litter	2011	2013	2015	2017	2019
1 (1+2)	<i>Pinus mugo</i> forest	1937	Dry *	No	No treatment	20	20	20	20	0
4**		1936	Dry-moist	No	No treatment	0	0	0	5	5
					Stump crushing	0			5	5
2 (6)	<i>Picea sitchensis</i> forest	1983	Dry	No	Stump crushing	5	0	0	5	5
6 (7+8)		1972	Dry-moist	No	Stump crushing	20	0	0	20	20
7**		1963	Dry		Stump crushing	0	0	0	5	5
3**	<i>Pinus sylvestris</i> forest	1936	Dry-moist	No	Stump removal	0	0	0	5	5
5**		2009	Dry	No	No treatment	0			5	5
					Stump crushing	0	0	0	5	5
					Stump removal	0			5	5
8 (11+12)	1963	Dry	Moist-wet	No	Stump crushing	5	0	0	5	5
5								5	5	
9 (9+10)		1964	Dry	Yes	Stump removal	10	0	0	10	10
<i>Total</i>						65	20	20	100	80

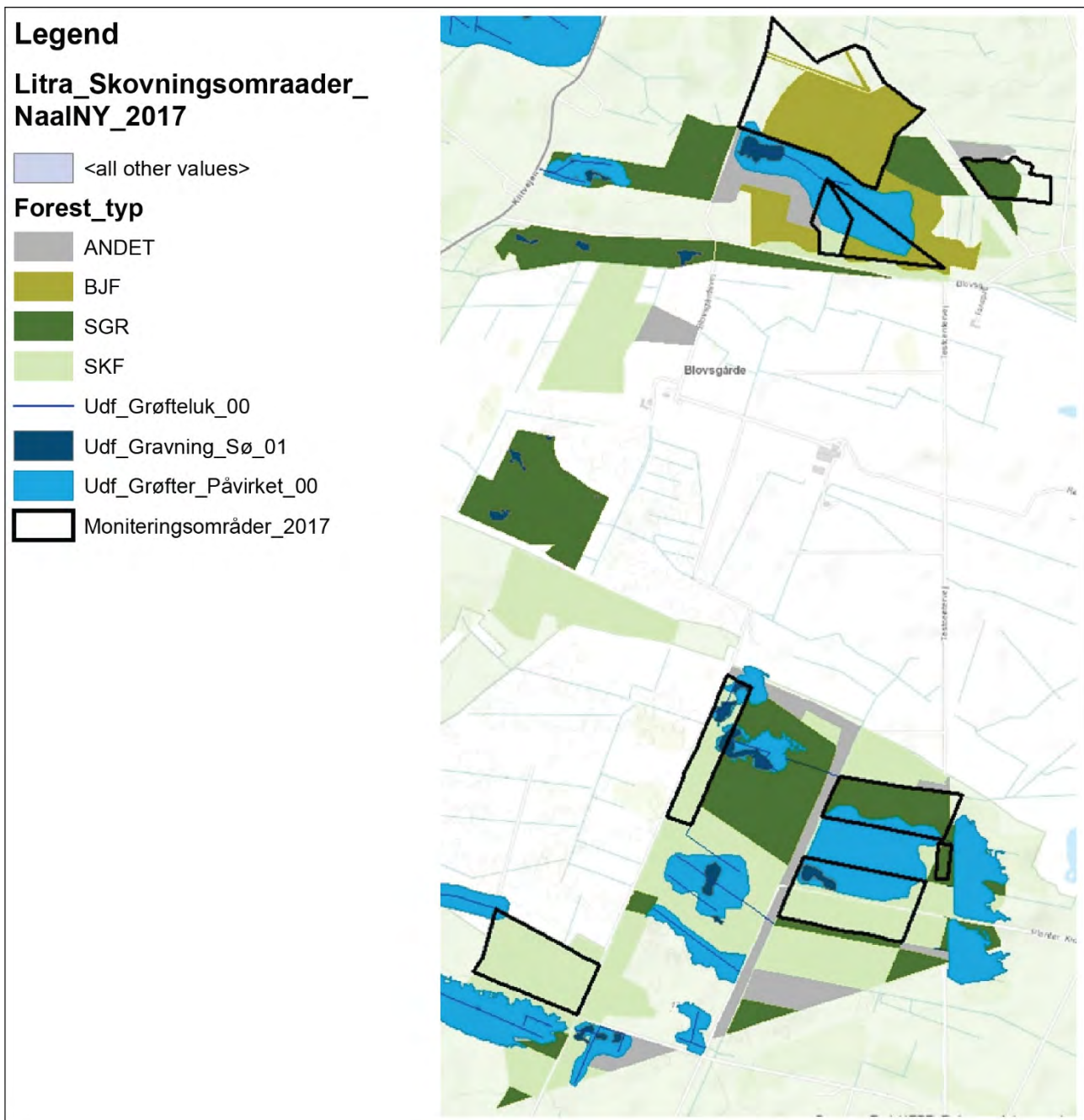


Figure 4. Implemented excavations of lakes and closure of drainage ditches in the test area and areas expected to be influenced by a higher groundwater level. Based on GIS-maps from the Danish Nature Agency in Thy. Legends: Skovningsomraader = clear-cut forest areas, Naal = conifers, Andet = miscellaneous, BJF = *Pinus mugo*, SGR = *Picea sitchensis*, SKF = *Pinus sylvestris*, Grøfteluk = closing of drainage ditches, Graving_Sø = establishment of a lake, Grøfter_Påvirket = drainage ditches affected, Moniteringsområde = monitoring area

3.4 Monitoring sites

Twelve monitoring sites were appointed prior to the clear-cutting of the selected forest stands in 2011 where 100 plots was laid out to cover the expected variation in the development of the vegetation composition (see chapter 3.5).

Three monitoring sites have been excluded from deforestation after the baseline monitoring in 2011 (sites 3-5 in Fig. 9 in Nygaard et al. 2011) and are no longer included in the monitoring program. The implemented post-cutting

treatments differed markedly from those planned when designing the monitoring program in 2011. To ensure a good representation of the implemented post-cutting treatments, DCE designated four new monitoring sites – no. 3, 4, 5 and 7. The latter site was established including the mowed verge on the western side of the main unpaved field road of the National Test Centre facility in order to document the effect of the presumably increasing acidity caused by road dust (Fig. 5, Tab. 1).

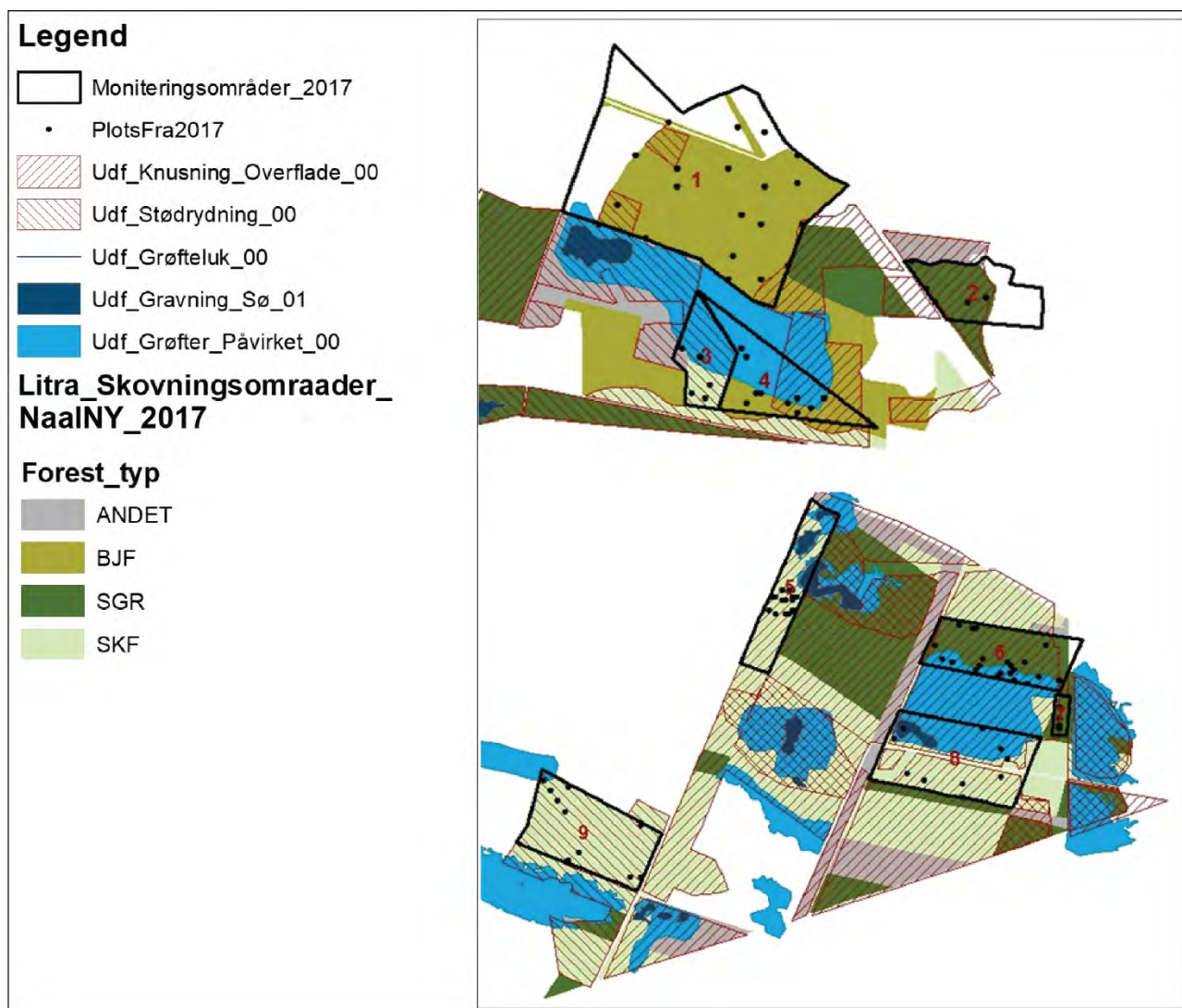


Figure 5. The nine monitoring sites and position of the 76 plots in the 2019 survey. Plots in sites 1, 2, 6, 8 and 9 were included in the baseline monitoring in 2011, while sites 3, 4, 5 and 7 were investigated for the first time in 2017, i.e. six years after the deforestation. Legends: Moniteringsområde = monitoring area, Udf_Knusning_overflade = Crushing on surface, Udf_Stødrydning = Clearing of stumps, Grøfteluk = closing of drainage ditches, Gravning_Sø = establishment of a lake, Grøfter_Påvirket = drainage ditches affected, Skovningsomraader = clear-cut forest areas, Naal = conifers, Andet = miscellaneous, BJF = *Pinus mugo*, SGR = *Picea sitchensis*, SKF = *Pinus sylvestris*,

3.5 Plots

Prior to the initiation of baseline monitoring in 2011, the 100 plots were randomly selected among grid cells in a 10 m reference net (Fig. 6) and marked as GPS waypoints. In each of the original twelve in 2011 now from 2017 nine monitoring sites, vegetation composition was investigated in five to twenty randomly established plots (Tab. 1). They were positioned according to a stratified random approach relative to forest type, post-cutting treatment of

trunks, stumps, and litter layer, hydrology, future management regimes, distance to appropriate seed sources, and topography in the project area. The result of the approach was that 20 plots were established in the northern *Pinus mugo* stand, 30 plots in three different *P. sylvestris* stands, and 50 plots in two *Picea sitchensis* stands (Fig. 9 and Tab. 1 in Nygaard et al. (2011)).

Dispersal limitation of target species was investigated by establishing a subset (two out of five) of the plots in the margins of restored sites in close vicinity to neighbouring light-open target habitat types. The aim with this location was to provide documentation of the rate and direction of vegetation development in areas with a high probability of an early dispersal of target species. The remaining three plots were randomly distributed in the matrix interior of each monitoring site (Fig. 6).

The randomly selected GPS waypoints were used to locate the 100 plots in the twelve monitoring sites in the normally dense plantations at the baseline monitoring in 2011. After the reforestation, the twenty plots in monitoring site no. 1 were re-investigated in 2013, 2015, and 2017. The position of the waypoints of the plots were determined by using a hand-hold GPS knowing that there could be an inaccuracy in re-finding the exact position due to the uncertainty in the determination of the exact location of the plot. In 2013, the position of the plot was photographed digitally in order to lessen the degree of uncertainty in the rediscovery of the plots in the preceding monitoring years (Wind 2013, 2016, Wind & Nygaard 2018).

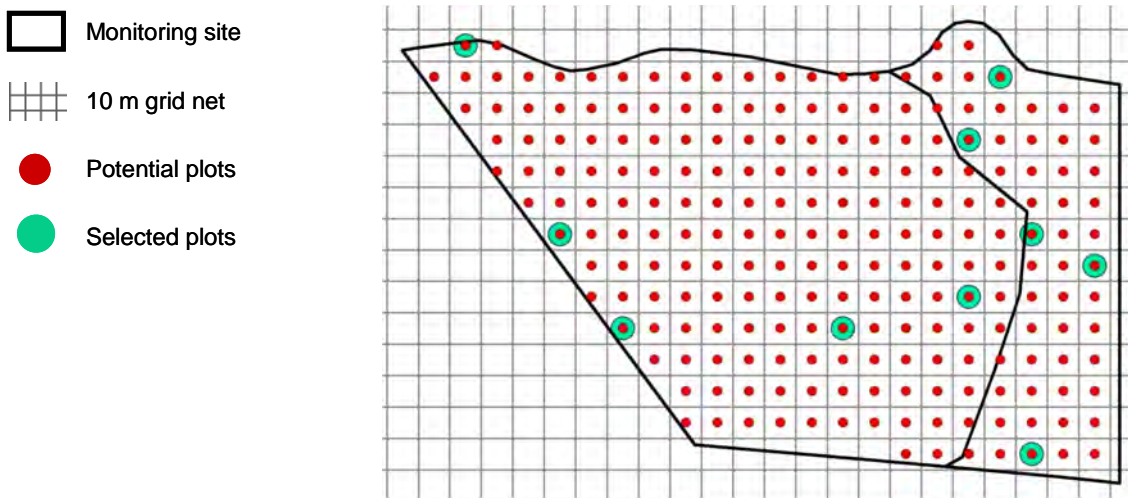


Figure 6. The random selection of 10 plots within a site.

In 2017, the plan was to re-investigate all 100 plots established before the clear-cutting in 2011. Various kinds of obstacles in the landscape led to the relocation of 17 plots from the original position and these were then re-coordinated using the GPS. Either a part of or the entire original 5 m circle interfered with field road systems established after 2011 (plots no. 85, 87, 130, 131, 132, and 133) or with a still functional drainage ditch (plots no. 65, 66 and 67). A newly established impassable fence hindered access to two plots (plots no. 68 and 69); while five plots were moved in accordance with the inaccuracy of the GPS measurements and the digital photos taken, implying that the plots were established at approximately the same spot as in 2013 and 2015 (plots no. 86, 92, 93, 94 and 95). Finally, one plot (no. 13) was moved northward to the shore of the newly established shallow water body. Besides, as the implemented post-cutting treatments differed markedly from those planned when designing the

monitoring program in 2011, 35 of the 100 plots have been repositioned prior to the 2017 investigation and numbered 100-134.

In 2019, the plan was to reinvestigate 45 of the original and the 35 repositioned plots while the 20 plots in the formerly afforested *Pinus mugo* stand were not investigated in 2019 in accordance with monitoring program.

Originally, 60 of the 100 plots have been placed in areas planned for livestock grazing. Before 2017, grazing has been initiated on monitoring site 9 involving plots no. 18 to no. 27. Between 2017 and 2019, grazing has been initiated on the northern part of monitoring site 5 involving plots no. 120 to no. 129.

Since 2017, a new telecommunication mast, the construction of three cement bases for attaching the wires that holds the telecommunication mast clamped and an associated unpaved access road was established in monitoring site 6. The construction work destroyed plots no. 32, 34, and 62 while the plots no. 31 and 35 were heavily affected by the construction of the cement bases causing the exposure of vast areas of naked sand in the plots. Besides, a pile of wooden flakes buried plot no. 17 on monitoring site 8 and therefore impossible to monitor in 2019.

Basic information on the 76 plots investigated in 2019 is compiled in Appendix 1.

4 Performance of the monitoring program

The reinvestigation of the 76 plots took place from 26th to 30th August 2019, eight years after the clear-cutting of a part of the two plantations in July and August 2011.

4.1 Methods

The monitoring method is by default based on the variables in the Danish NOVANA program for terrestrial habitats (Fredshavn et al. 2011). In accordance with the program each plot consists of a core square of 0.5 * 0.5 m² (the pinpoint frame) and a documentary circle with a radius of 5 m (78.5 m², the 5 m circle). The pinpoint frame is placed with the broad sides oriented against the corners of the Earth by using a compass. The southwest corner of the frame is defined by the GPS waypoint in question and is laid out as accurately as possible according to the GPS coordinates as there are no permanent field markings of the centres of the plots. The white string used for delimiting the 5 m circle is stretched towards the south. An overall digital picture is taken in the direction north from an appropriate point south of the 5 m circle limit. The picture covers the whole 5 m circle and has the pinpoint frame in its centre, although the frame is not always visible due to dense vegetation cover. Appendix 1 contains the picture numbers and the dates.

The pinpoint frame is divided by four parallel strings stretched from one broad side to the opposite one in both directions, resulting in 16 points where the strings cross, i.e. 'crossover points'. The analysis of vegetation composition starts at the northwest crossover point, followed by the neighbouring crossover point to the east, ending with the 16th crossover point in the southeast corner. A straight, slender pin is stuck vertical in direction northeast at each of the 16 crossover point to the surface of the soil. Vascular plants touching the pin are determined in the field and recorded to the species level, when possible, on the field scheme. Undeterminable specimens are either noted as an 'undetermined species' or referred to on a higher taxonomic level.

The cryptogam flora constitutes a considerable and important part of the biodiversity in Danish dune areas wherefore identification on species level when possible has been focused in the monitoring program. The most characteristic bryophytes and lichens are determined in the field and recorded on the species level on the field scheme. If determination of the sampled cryptogam specimen was not possible in the field, the specimen was recorded in one of the following five categories: Bryophyte, liverwort, *Cladonia* sp. s.l., *Cladonia* sp. and *Cladonia* sp. s.s. on the field scheme. In the analysis of the species data, no undetermined specimens are included.

The pin may, when penetrating the vegetation, touch more species of vascular plants, bryophytes, and lichens as the vegetation cover may consist of several layers. When the crossover point is free of vegetation cover, the substrate recorded at the pin is categorised either as dead wood, litter, dung, naked soil, sand, or free water surface. The entire area under the pinpoint frame is then examined for supplementary, rooted species that have not been recorded at the pin. Such species are recorded separately on the field scheme.

Mean vegetation height is measured at the four corners of the pinpoint frame, starting at the inner side of the northwest leg, ending at the southeast corner of the frame. The angle of the inclination is measured with a compass placed on the upper side of the pinpoint frame by using the arrow inside the compass house as an angle meter.

The examination of the 5 m circle is commenced to the south by walking along the stretched 5 m white string. When the area along the string has been examined for additional species, the string is moved clockwise and the examination of the next area to the left of the string begins. The search for additional species continues until all 78.5 m² of the 5 m circle have been examined. During the search for additional species, the coverage of bryophytes, lichens, naked soil and sand, open water and dead wood is estimated (Tab. 2).

Table 2. The ecological parameters included in the monitoring program. * Soil content of organic matter and total nitrogen were measured in 2011 in two plots at each monitoring site. (X) measured for one plot (# 92) only.

Monitoring variables	Frame (0.25 m²)	Circle (78.9 m²)	Baseline 2011	Post-construction 2013-19	2021
Vegetation composition					
Species abundances	X				
Vascular plant species at species level			X	X	X
Bryophytes at genus or species level			X	X	X
Lichens at species/group level			X	X	X
Species composition					
Vascular plant species at species level		X	X	X	X
Vegetation structure					
Mean vegetation height	X		X	X	X
Cover of dwarf shrubs		X	X	X	X
Cover of trees and bushes		X		X	X
Cover of dead wood				X	X
Cover of bryophytes		X	X	X	X
Cover of lichens		X	X	X	X
Canopy density		X	X	(X)	
Substrate					
Cover of open water	X	X	X	X	X
Cover of bare soil/sand	X	X	X	X	X
Cover of litter	X	X	X	X	X
Cover of dead wood	X	X		X	X
Litter depth		X	X		
Soil chemistry					
pH	X		X		X
Organic matter *	X		X		X
Total nitrogen *	X		X		X
Inclination of the frame and its direction					
	X	X	X	X	X

5 Results

The species lists and structural data from the 76 investigated plots are presented in the appendices (Tab 4).

Table 3. Content of the appendixes of the former forest stand, the monitoring sites and plots numbers and the monitoring date. Plots 17, 32, 34 and 62 were excluded (see chapter 3.5). In brackets are listed plots that have been moved and renumbered.

Appendix	2	3	4	5	6
Former forest stand	Pinus sylvestris	Picea sitchensis	Pinus sylvestris & P. mugo	Pinus sylvestris	Picea sitchensis
Monitoring site no.	8 & 9	6 & 2	3 & 4	5	7
Plots no.	8-12, 14-16, 18-27 & 187 (13)	28-31, 35, 37-38, 40-41, 46, 51-52, 57, 59, 70, 75, 77, 189-191 (65-67) & 199-200 (68-69)	100-104 & 105-114	115-129	134 & 206-209 (133-134)
No. of plots monitored	19	22	15	15	5
Monitoring dates	27, 28, & 30 August 2019	27, 28 & 29 August 2019	26 & 27 August 2019	29 August 2019	28 August 2019

5.1 Species composition and richness

In the 76 plots, 122 taxa were recorded during the fieldwork in 2019. In total 67 dicots were recorded, including 13 fanerophytes (trees and shrubs), eight chamaephytes (dwarf shrubs), and 12 therophytes (annuals). With 34 taxa, monocots constituted the second largest fraction of the species composition, comprising 16 grasses, nine sedges, and nine rushes. The gymnosperms contributed with two species, while three species of ferns were recorded. The determinable part in the field of the recorded cryptogam flora comprised of nine bryophyte and two lichen taxa.

Species richness varied widely between the 76 plots from nine taxa in two plots (no 12 and 46) formerly covered by *Pinus sylvestris* and *Picea sitchensis* stands to 39 taxa in plot 134 adjacent to the main unpaved field road in a former *Picea sitchensis* stand. The highest number recorded in areas with former canopies of *Pinus sylvestris* and *Picea sitchensis* was 30 taxa (plot 19) and 23 (plot 113), respectively. In the monitored *Pinus mugo* stand the number of taxa ranged from 14 (plot 101) to 21 (plots 103 and 104).

Table 4. The most widespread species recorded in the plots as percentage of the 76 plots according to life form and plot category based of the dominating tree species forming the canopy prior to the clear-cutting. PM = *Pinus mugo*. PSyl = *Pinus sylvestris*. PSit = *Picea sitchensis*. 'New' = plots established in 2017.

Navn	PSyl	PSit	New in PM	New in PSyl	New on verge in PSit	Mean percentage
Site no.	8+9	2+6	4	3+5	7	
No. of plots	19	22	10	20	5	
Fanerophytes (trees and shrubs)						
<i>Betula pubescens</i>	21	14	30	10	0	15
<i>Myrica gale</i>	79	0	20	0	0	20
<i>Picea sitchensis</i>	21	73	0	10	0	21
<i>Pinus sylvestris</i>	21	32	20	5	0	16
<i>Quercus robur</i>	5	23	10	20	0	12
<i>Salix aurita</i>	26	18	30	15	60	30
<i>Salix repens</i>	37	0	60	10	80	37
Chamaephytes (dwarf shrubs)						
<i>Calluna vulgaris</i>	89	100	100	95	100	97
<i>Empetrum nigrum</i>	32	9	90	35	0	33
<i>Erica tetralix</i>	74	91	50	70	100	77
<i>Vaccinium uliginosum</i>	53	23	90	45	0	42
Broadleaved herbs						
<i>Cerastium fontanum subsp. vulgare</i>	47	9	0	35	100	38
<i>Chamaenerion angustifolium</i>	16	73	30	45	40	41
<i>Galium saxatile</i>	32	27	60	60	20	40
<i>Hypochaeris radicata</i>	68	64	50	85	100	73
<i>Lysimachia europaea</i>	11	9	70	0	0	18
<i>Potentilla erecta</i>	47	50	10	55	100	52
<i>Rumex acetosa</i>	21	9	10	10	0	10
<i>Rumex acetosella</i>	53	82	50	80	80	69
<i>Senecio sylvaticus</i>	21	50	30	55	40	39
Grasses and grass allies						
<i>Agrostis capillaris</i>	63	50	0	70	100	57
<i>Avenella flexuosa</i>	79	91	100	100	40	82
<i>Carex arenaria</i>	47	36	80	50	0	43
<i>Carex echinata</i>	21	18	0	15	40	19
<i>Carex nigra</i>	21	27	30	10	0	18
<i>Carex pilulifera</i>	32	18	0	30	0	16
<i>Eriophorum angustifolium</i>	5	32	0	25	20	16
<i>Holcus lanatus</i>	53	77	0	95	100	65
<i>Juncus conglomeratus</i>	16	18	30	0	40	21
<i>Juncus effusus</i>	79	59	50	55	80	65
<i>Juncus squarrosus</i>	53	45	40	40	0	36
<i>Luzula multiflora s.l.</i>	11	18	10	5	20	13
<i>Molinia caerulea</i>	84	100	80	80	100	89
Ferns						
<i>Dryopteris carthusiana</i>	58	27	30	60	20	39
<i>Dryopteris dilatata</i>	16	5	20	15	20	15
<i>Polypodium vulgare</i>	5	0	0	15	0	4

Bryophytes

<i>Bryopsida</i>	42	41	30	30	20	33
<i>Campylopus introflexus</i>	53	45	10	70	60	48
<i>Dicranum scoparium</i>	63	41	60	55	40	52
<i>Hypnum cupressiforme/H. jutlandicum</i>	47	55	0	40	20	32
<i>Pleurozium schreberi</i>	53	9	10	20	20	40
<i>Polytrichum commune/Polycastrum formosum</i>	0	9	0	30	40	16
<i>Polytrichum juniperinum</i>	47	5	0	10	40	20
<i>Scleropodium purum</i>	26	14	30	40	60	34

Lichenes

<i>Cladonia chlorophaea</i> aggr.	21	5	0	55	40	24
<i>Cladonia portentosa</i>	0	0	10	20	0	6
<i>Cladonia</i> sp.	32	23	60	50	0	33
<i>Cladonia</i> sp. s.s.	21	41	90	10	0	32

5.2 The most widespread species

The dwarf shrub *Calluna vulgaris* was the most widespread species recorded in 97 % of the plots. The grasses *Molinia caerulea* and *Avenella flexuosa* were the second and third most widespread species recorded in 89 and 82 % of the plots, respectively. Other abundant species were the dwarf shrub *Erica tetralix*, the broadleaved herbs *Hypochaeris radicata* and *Rumex acetosella*, and the grasses *Holcus lanata* and *Agrostis capillaris* although the two grasses were not recorded in any of the 10 plots in the former *Pinus mugo* stand. *Juncus effuses* was the most abundant rush recorded in more than two-thirds of the plots. *Dryopteris carthusiana* was the most abundant fern species recorded in almost two-fifths of the plots. Among the bryophytes, *Dicranum scoparium* and the invasive *Campylopus introflexus* were the most abundant species recorded in approximately half of the plots (Tab. 4). The mean number of taxa per plot was 20.

The influence of the main unpaved field road on the species composition is obvious. Thus, 19 broadleaved herb species were more frequently or exclusively recorded in the vegetation cover of the five verge plots compared with the remaining 71 plots (Tab. 5).

Table 5. Species confined to or most frequent in percentage in the five verge plots (plots 134, 206-209) according to life form and plot category based of the dominating tree species forming the canopy prior to the clear-cutting. PM = *Pinus mugo*. PSyl = *Pinus sylvestris*. PSit = *Picea sitchensis*. 'New' = plots established in 2017.

Plot categories/former forest type	PSyl	PSit	New in PM	New in PSyl	New on verge in PSit
Site no.	8+9	2+6	4	3+5	7
No. of plots	19	22	10	20	5
Broadleaved herbs					
<i>Argentina anserina</i>	5	5	0	0	100
<i>Artemisia vulgaris</i>	0	0	0	0	20
<i>Cirsium arvense</i>	5	0	0	0	80
<i>Cirsium vulgare</i>	5	0	0	0	40
<i>Elytrigia repens</i>	0	0	0	0	20
<i>Epilobium adenocaulon</i>	0	0	0	0	40
<i>Geranium molle</i>	0	0	0	0	20
<i>Lolium perenne</i>	0	0	0	0	20
<i>Medicago lupulina</i>	0	0	0	0	60
<i>Plantago lanceolata</i>	0	0	0	0	40
<i>Plantago major</i>	0	0	0	0	80
<i>Prunella vulgaris</i>	0	0	0	0	60
<i>Ranunculus repens</i>	0	0	0	5	100
<i>Rumex crispus</i>	0	0	0	0	20
<i>Rumex obtusifolius</i>	0	0	0	0	20
<i>Scorzoneroides autumnalis</i>	11	5	0	5	100
<i>Sonchus arvensis</i>	0	0	0	0	20
<i>Sonchus asper</i>	0	0	0	0	20
<i>Trifolium pratense</i>	0	0	0	0	60

5.3 Species coverage

In 2019, *Avenella flexuosa* had the highest coverage of 43 % in the pinpoint frames succeeded by *Molinia caerulea* with coverage of 32 %. Of other grasses and grass allies recorded, *Agrostis capillaris* and *Holcus lanatus* had an average coverage of 2 % and 7 %, while *Carex arenaria*, *C. echinata*, *Eriophorum angustifolium*, and *Juncus effusus* had coverage's of 11 %, 2 %, 2 %, and 3%, respectively (Table 6).

Among the chamaephytes (dwarf shrubs), *Calluna vulgaris* had the highest mean coverage of 16 % followed by *Vaccinium uliginosum* with 5 %. *Erica tetralix* and *Empetrum nigrum* had coverage of 4 % and 1 %.

Myrica gale was the only fanerophyte (woody shrub) recorded at the pins in the pinpoint frames with coverage of 2 %. Besides, *M. gale* was recorded as an additional species in thirteen plots.

The broad-leaved herbs *Hypochaeris radicata*, *Galium saxatile*, and *Rumex acetosella* had coverage of 3 %, 1 %, and 1 %, respectively.

Among the bryophytes, *Pleurozium schreberi* had the highest coverage of 7 %, while *Hypnum cupressiforme/H. jutlandicum* had the second highest coverage

with 4 %. Of the other bryophytes, *Dicranum scoparium* and *Scleropodium purum* had coverage of 1 % and 3 %. The invasive species *Campylopus introflexus* had coverage of 1 %. Besides, the latter species was recorded as an additional species in twenty-seven 5 m circles in most of the former forest types (Tab. 6, Appendix 2-6).

Table 6. The most prominent species recorded at the pinpoint frames' pins at the 76 plots according to life form and plot category in percentage. Eighteen species with coverage less than 1 % are omitted. The omitted species belongs to the following life forms: Five fanerophytes, eight broadleaved herbs, four grasses and grass allies, two ferns, and two bryophytes.

Plot categories/former forest type	PSyl	PSit	New PM	New PSyl	New verge	Total	No of sites
Site no.	8+9	2+6	4	3+5	7		
Total no. of plots	19	22	10	20	5	76	
Total no. of pins	304	352	160	320	80	1216	
Fanerophytes (trees and shrubs)							
<i>Myrica gale</i>	4	0	8	0	0	2	4
Chamaephytes (dwarf shrubs)							
<i>Calluna vulgaris</i>	16	18	38	12	0	16	30
<i>Empetrum nigrum</i>	0	0	1	5	0	2	4
<i>Erica tetralix</i>	6	4	1	3	0	4	13
<i>Vaccinium uliginosum</i>	2	2	29	0	0	5	8
Broad-leaved herbs							
<i>Galium saxatile</i>	0	0	6	3	0	18	2
<i>Hypochaeris radicata</i>	5	1	0	5	3	3	13
<i>Rumex acetosella</i>	0	4	0	0	4	1	6
Grasses and grass allies							
<i>Agrostis capillaris</i>	0	1	0	1	31	3	7
<i>Avenella flexuosa</i>	22	54	44	58	6	43	55
<i>Carex arenaria</i>	7	3	26	17	0	11	24
<i>Carex echinata</i>	2	4	0	0	0	2	2
<i>Eriophorum angustifolium</i>	0	5	0	1	0	2	3
<i>Holcus lanatus</i>	1	5	0	12	31	7	19
<i>Juncus effusus</i>	4	4	0	3	6	4	10
<i>Molinia caerulea</i>	47	36	13	17	58	32	49
Bryophytes							
<i>Bryopsida</i>	2	1	4	0	1	2	8
<i>Campylopus introflexus</i>	3	1	0	2	0	2	11
<i>Dicranum scoparium</i>	2	1	4	0	0	1	10
<i>Hypnum cupressiforme/ H. jutlandicum</i>	5	7	0	3	0	4	15
<i>Pleurozium schreberi</i>	10	>1	25	6	0	7	17
<i>Scleropodium purum</i>	0	1	16	2	0	3	10

5.4 Remarkable and new species

The many construction activities in the National Test Centre have caused a lot of disturbance of the vegetation cover lately especially in monitoring site no. 6 (see Fig. 5), as described in chapter 3.5. The construction activities have caused the removal of the newly established vegetation cover and the exposure of the underlying sand layer. Thus, low nutrient demanding pioneer species especially annuals have the chance to sprout and thrive on the exposed

sand areas. The following annuals have been recorded in the two heavily affected plots 31 and 35: *Persicaria lapathifolia* subsp. *pallida*, *Senecio sylvatica*, and *Spergula arvensis*.

Ten species that have not been recorded in the previous monitoring years have been recorded in the plots in 2019. The new species are the shrubs *Amelanchier spicata*, *Prunus serotina* and an indeterminable young shoot of a *Crataegus* species, the rush *Luzula campestris*, and the broad leaf herbs *Linnaria vulgaris* and *Veronica officinalis*. Besides, the broad-leaved herbs *Rumex obtusifolius* and *Vicia cracca* together with the grasses *Lolium perenne* and *Phalaris arundinacea* are new, recorded in the verge of the main unpaved field road. All recorded new species are common in Denmark. The recording of new species illustrates, that some species are able to spread as they presumably are found in other parts of the National Test Centre or in the neighbourhood.

Special attention should be given to the non-native shrubs *Amelanchier spicata* and *Prunus serotina* as both species together with the bryophyte *Campylopus introflexus* and the spruce *Picea sitchensis* are included on the national list on invasive species.

The rare milkwort *Polygala serpyllifolia* associated with nutrient poor habitats, which was rediscovered in 2017 in a former *Pinus sylvestris* stand (Wind & Nygaard 2018), still persists in the same plots.

6 Discussion

The establishment of the National Test Centre facility at Østerild has involved clear-cutting of trees in the central part of Østerild Klitplantage and in the southeast part of Hjørdemål Plantage. The general aim of the deforestation has been to create room for the wind turbines and the establishment of a main unpaved field road in order to secure access to the wind turbines, to the telecommunication masts, and to the other facilities connected to the test centre.

The deforestation in 2011 has led to a significant reduction of the amount of tree species in the monitoring sites. The original plantation tree species mostly occur as seedlings or young trees no higher than 1-2 m. Two of the original plantation trees, the alien spruce *Picea sitchensis* and the native fir *Pinus sylvestris*, are still present. Besides, other frequent recorded fanerophytes are *Myrica gale*, *Salix aurita* and *S. repens*. They prefer moist habitat conditions.

One of the major biological aims of the management of the project area is to increase the area covered by the three habitat types, 2130, 2140 and 2190 (Fig. 1). The 2019 investigation proved that especially *Calluna vulgaris* is widespread but with low coverage. Other widespread dwarf shrub species are *Empetrum nigrum*, *Erica tetralix*, and *Vaccinium uliginosum* thus constituting an important part of the vegetation cover. *Calluna* and *Empetrum* are characteristic of dry dune heath while the two latter species characterises wet dune heath.

Grasses, rushes, and sedges have benefited from the deforestation. Especially *Avenella flexuosa* and *Molinia caerulea* have spread. The two grasses dominate the vegetation in many of the former forest areas. Other dominant grass species are *Agrostis capillaris* and *Holcus lanatus* both preferring dry habitat conditions. Among the rushes, *Juncus effusus* and *J. squarrosus* are widespread while *Carex arenaria* is by far the most widespread sedge. *A. flexuosa*, *A. capillaris*, *H. lanatus*, *J. squarrosus*, and *C. arenaria* grow in dry habitats, while *M. caerulea* and *J. effusus* normally prefer habitats with a higher humidity.

Among the broad-leaved herbs, *Galium saxatile*, *Hypochaeris radicata*, *Potentilla erecta*, and *Rumex acetosella* are the most widespread species all preferring dry habitat condition. The four species together with *Chamaenerion angustifolium* and *Senecio sylvaticus* are widespread but do not occur in large, cohesive populations like the grasses and some of the dwarf shrubs.

In 2019, especially the establishment of a new telecommunication mast with its associated anchorage, the construction of an access road paved with gravel and the transport of building material may have caused much disturbance, the exposure of naked sand. Besides, the disturbance may have caused a change in the pH level which all might have led to the appearance of several species in the neighbouring, affected plots. Among these are especially annuals preferring disturbed habitats. Some of the species have not been recorded at any of the plots by the monitoring in the previous years. In total, 18 new species have been recorded at the plots for the first time in 2019.

Most of the recorded vascular plant species in the plots belong to the natural vegetation cover of the Østerild area and are characteristic of dry and wet dune heaths and dune slacks. Accidental spread of invasive alien species on

the newly exposed soil was a possibility after the clear-cutting of the plantations followed by removal of chopped trees, stumps, and larger branches at some of the monitoring sites, with a subsequent release of nutrients. The invasive alien bryophyte *Campylopus introflexus* was indeed recorded in 26% of the plots, especially in the area of the former *Picea sitchensis* stands. Besides, the invasive aliens *Amelanchier spicata* and *Prunus serotinus* have been recorded as new species in the plots in 2019. The two species are known to be able to spread rapidly and may potentially compete with the low-growing, light-demanding species associated with the target habitats.

Invasion of conifer trees, especially *Picea sitchensis*, *Pinus mugo*, and *P. sylvestris*, is a continuing threat as the three species are the dominant tree species in the remaining parts of Østerild Klitplantage and Hjardemål Plantage. The three species can produce viable seeds that are able to spread to and germinate on the light-open areas of the project area. Conifer seedlings and minor trees were recorded in a few monitoring plots but were not by now a serious threat to the recovery of the target habitat types. The low abundance of coniferous trees in the clear-cut monitoring plots is not reflecting the natural succession in the area, as the Danish Nature Agency counteracts the re-growth by continuous clearing of juvenile trees. The shrubs *Rosa rugosa*, that have proved to be aggressive in other dry coastal dune heath areas, was not recorded in any of the plots in 2019. The native herbal species, *Chamaenerion angustifolium*, *Galeopsis bifida*, and *Senecio sylvatica*, are able to produce large amounts of viable seeds that may spread rapidly and form large stands on exposed soil due to the release of nutrients, were recorded in modest populations or as single plants, only.

7 Conclusion

Seventy-six plots were investigated in August 2019 in the National Test Centre at Østerild in northern Jutland. Of these, 41 were surveyed in the 2011 baseline monitoring, while 35 were relocated in 2017 and surveyed in 2019 for the second time. The reason for the change of the original monitoring program was that some of the intended management actions had not been accomplished, and that the deforestation of some parts of the plantation was not carried out as originally planned.

Following the clear-cutting of the former coniferous stands, a number of low-growing, light-demanding vascular plants, bryophytes, and lichens have spread. Four species of grasses, *Agrostis capillaris*, *Avenella flexuosa*, *Holcus lanatus* and *Molinia caerulea*, and one rush, *Juncus effuses*, have in 2019 been recorded in more than 50 % of the plots. Among the broad-leaved herbs, especially three species, *Hypochaeris radicata*, *Potentilla erecta*, and *Rumex acetosella*, are occurring extensively in the project area.

Clear-cutting of a forest area and removal of the chopped trunks, branches, and stumps may alter the composition of the soil where the trees have grown and lead to release of nutrients. Consequently, non-local native species and invasive alien species may spread on the deforested areas and compete strongly with the native flora. So far, only modest populations or single plants of the alien, invasive species *Amelachier spicata* and *Prunus serotinus* has been recorded in 2019 at Østerild. Nevertheless, the surrounding plantation holding *Picea sitchensis*, *Pinus mugo* and *P. sylvestris* is a continuous source of seeds that may spread to and invade the light-open habitats of the project area.

The 2019 investigation of the plots showed that a large number of species of vascular plants, bryophytes, and lichens have spread and in some plots form dense vegetation swards in the project area. The spread of species has been rapid and started alongside with the clear-cutting of the stands and the removal of cut trees, trunks, branches and stumps. The establishment of wet and dry sites has created new habitats not present before and has improved the species diversity of vascular plants, bryophytes, and lichens as 18 new species of vascular plants were recorded in the 2019 investigation.

The major biological objective after the clear-cutting of the project area is to direct the vegetation succession on the areas unaffected by the National Test Centre facility towards the target communities – dry and wet heathland and dune slacks. Secondly, the aim is to improve the diversity of natural species compared with the situation before the deforestation of the project area by creating suitable habitats for light-favouring, low-growing species with low nutrient demands dependent on a fluctuating water table and changing moistness. If the biological objectives are fulfilled must await the more in-depth analysis of all the gathered vegetation and structural data that will be performed after the completion of the project as a whole in 2021.

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8 References

Danmarks Miljøundersøgelser & Miljøministeriet 2010: Implementeringsplan for nationalt vindmøllestcenter i Østerild. <http://www.naturstyrelsen.dk/NR/rdonlyres/69440263-08B3-4835-A6AFD862FA83D931/114539/>

Ejrnæs, R., Bruun, H.H. & Graae, B.J. 2006. Community assembly in experimental grasslands: Suitable environment or timely arrival? *Ecology* 87(5): 1225-1233.

Fredshavn, J.R., Nielsen, K.E., Ejrnæs, R. & Nygaard, B. 2011. Overvågning af terrestriske naturtyper: v.1.07. (Teknisk anvisning fra Fagdatacenter for Biodiversitet og Terrestrisk Natur; TA-N01).

Miljøministeriet 2009. VVM-redegørelse: Nationalt testcenter for vindmøller. Miljøministeriet, København

Naturstyrelsen, Miljøministeriet 2012. Østerild Klitplantage. Vandretursfolder 55.

http://naturstyrelsen.dk/media/138162/55_oesterild_290515_web.pdf

Nygaard B. Wind P. & Ejrnæs R. 2011. Regeneration of dune habitats in Østerild Klitplantage - baseline monitoring 2011. Aarhus University, DCE – Danish Centre for Environment and Energy, 36 pp. - Scientific Report from DCE – Danish Centre for Environment and Energy No. 13.

<http://www.dmu.dk/Pub/SR13.pdf>

Sturgess, P. & Atkinson, D. 1993. The clear-felling of sand-dune plantations: Soil and vegetational processes in habitat restoration. *Biological Conservation* 66: 171-183.

Wind P. 1991. Oversigt over botaniske lokaliteter. Bind 8. Viborg amt. - Miljøministeriet. Skov- og Naturstyrelsen. Hørsholm.

Wind P 2013. Monitoring the vegetation recovery in Østerild Klitplantage 2013. Part 1. Aarhus University, DCE – Danish Centre for Environment and Energy, 40 pp. Technical Report from DCE – Danish Centre for Environment and Energy No. 30 <http://dce2.au.dk/pub/TR30.pdf>

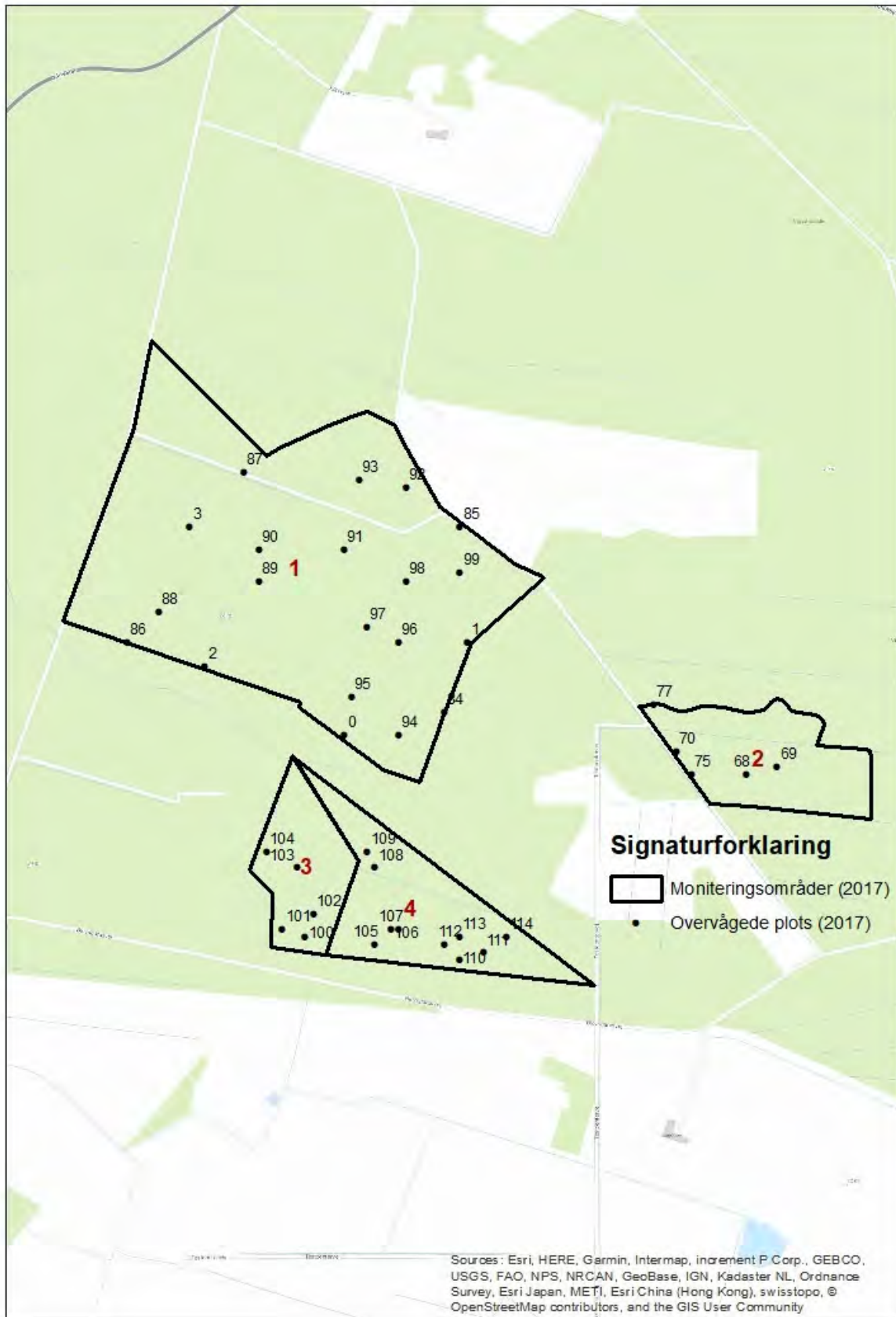
Wind P 2016. Monitoring the vegetation recovery in Østerild Klitplantage 2015. Part 2. Aarhus University, DCE – Danish Centre for Environment and Energy, 44 pp. Technical Report from DCE – Danish Centre for Environment and Energy No. 73 <http://dce2.au.dk/pub/TR73.pdf>

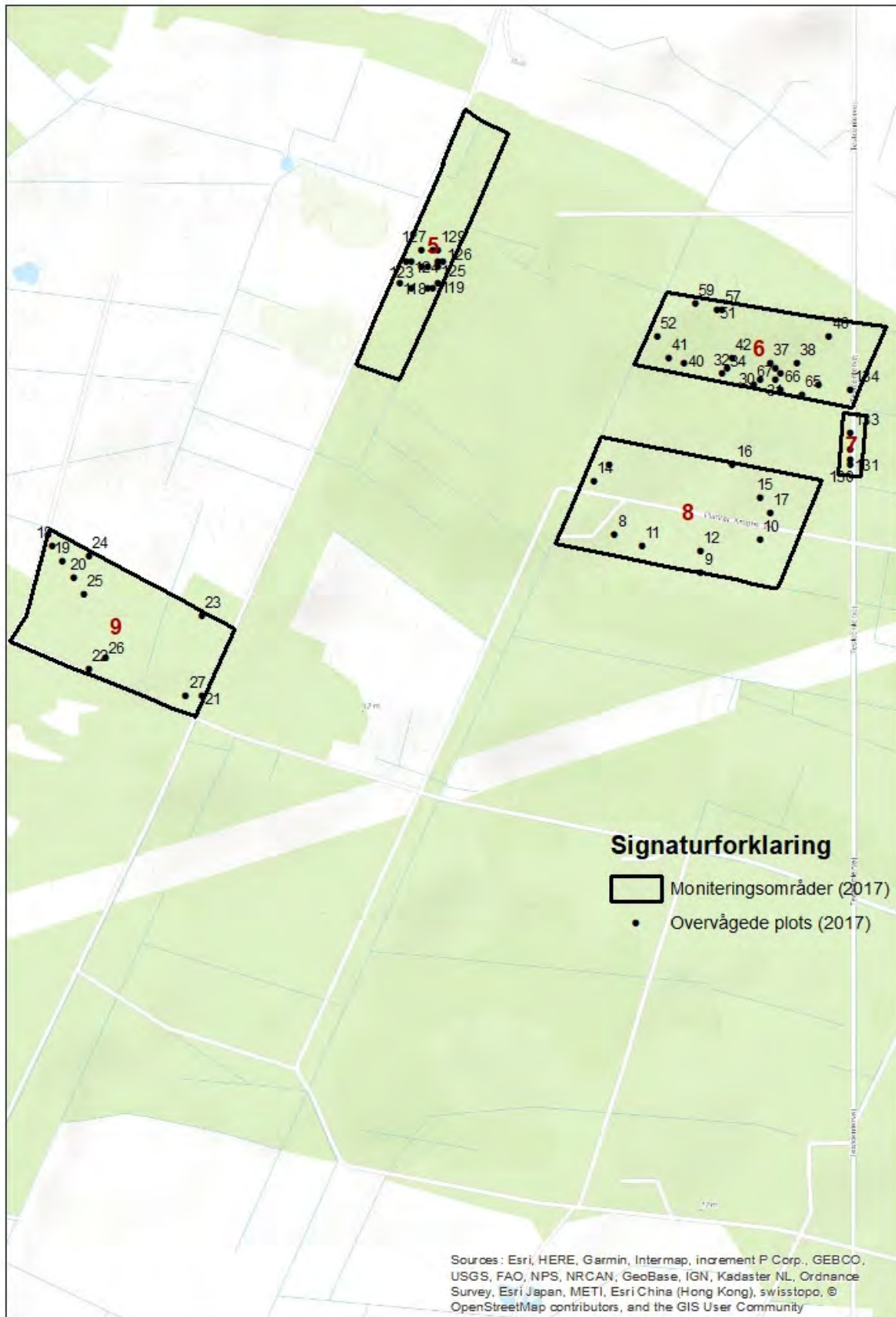
Wind P. & Nygaard B. 2018. Monitoring the vegetation recovery in Østerild Klitplantage 2017. Part 3. Aarhus University, DCE – Danish Centre for Environment and Energy, 170 pp. Technical Report from DCE – Danish Centre for Environment and Energy No. 118 <http://dce2.au.dk/pub/TR118.pdf>

Appendix 1

Maps and overview of the investigated monitoring plots in 2019. The former canopy forming conifer species is indicated under each site number in the table. The position of the plots has not been corrected for those that have been moved.

Legends on maps: 'Moniteringsområde' – monitoring site, 'Overvågede plots' – monitoring plots surveyed in 2019.





Site no.	Plot no.	Date	North	East	Remarks on the plots	Picture no.
2 <i>Picea sitchensis</i>	200	27-8	57°05.070'	8°53.226'		5651
	199	27-8	57°05.083'	8°53.222'		5652
	70	27-8	57°05.079'	8°53.184'		5650
	75	27-8	57°05.063'	8°53.204'		5649
	77	27-8	57°05.112'	8°53.114'		5648
3 <i>Pinus sylvestris</i>	100	26-8	57°04.949'	8°52.710'		5636
	101	26-8	57°04.955'	8°52.680'		5635
	102	26-8	57°04.966'	8°52.719'		5634
	103	26-8	57°04.998'	8°52.699'		5628
	104	26-8	57°05.009'	8°52.660'		5627
4 <i>Pinus mugo</i>	105	26-8	57°04.944'	8°52.799'		5631
	106	26-8	57°04.955'	8°52.818'		5632
	107	26-8	57°04.955'	8°52.828'		5633
	108	26-8	57°04.998'	8°52.798'		5630
	109	26-8	57°05.009'	8°52.789'		5629
	110	27-8	57°04.934'	8°52.908'		5642
	111	27-8	57°04.939'	8°52.937'		5643
	112	27-8	57°04.944'	8°52.888'		5644
	113	27-8	57°04.950'	8°52.908'		5645
	114	27-8	57°04.950'	8°52.967'		5646
5 <i>Picea sitchensis</i>	115	29-8	57°04.006'	8°52.267'		5621
	116	29-8	57°04.006'	8°52.297'		5693
	117	29-8	57°04.006'	8°52.307'		5692
	118	29-8	57°04.011'	8°52.248'		5690
	119	29-8	57°04.011'	8°52.317'		5694
	120	29-8	57°04.027'	8°52.287'		5702
	121	29-8	57°04.027'	8°52.297'		5701
	29-8	29-8	57°04.027'	8°52.317'		5695
	123	30-8	57°04.033'	8°52.257'		5703
	124	30-8	57°04.033'	8°52.267'		5706
	125	29-8	57°04.033'	8°52.317'		5696
	126	29-8	57°04.033'	8°52.327'		5697
	127	29-8	57°04.043'	8°52.287'		5700
	128	29-8	57°04.043'	8°52.307'		5699
	129	29-8	57°04.043'	8°52.317'		5698
6 <i>Picea sitchensis</i>	29	29-8	57°03.910'	8°53.020'		5683
	30	28-8	57°03.915'	8°52.911'		5680
	31	28-8	57°03.915'	8°52.940'		5681
	32	28-8	57°03.920'	8°52.842'	Plot destroyed by construction work	
	34	28-8	57°03.925'	8°52.851'	Plot destroyed by construction work	
	35	29-8	57°03.926'	8°52.940'	Plot heavily affected by construction work	5686
	37	29-8	57°03.931'	8°52.940'	Plot partly destroyed by construction work	5687
	38	29-8	57°03.931'	8°52.980'		5688
	40	28-8	57°03.931'	8°52.772'		5672
	41	28-8	57°03.936'	8°52.743'		5673
	42	28-8	57°03.936'	8°52.861'		5671
	46	29-8	57°03.958'	8°53.039'		5689
	51	28-8	57°03.985'	8°52.831'		5677
	52	28-8	57°03.958'	8°52.723'		5674
	57	28-8	57°03.985'	8°52.841'		5678
	59	28-8	57°03.990'	8°52.792'		5676
	62	28-8	57°03.920'	8°52.950'	Plot destroyed by construction work	

	191	29-8	57°03.903'	8°52.989'		5684
	190	28-8	57°03.910'	8°52.949'		5682
	189	28-8	57°03.913'	8°52.901'	Plot heavily affected by construction work	5679
7	209	28-8	57°03.828'	8°53.072'		5666
<i>Picea stichensis</i>	208	28-8	57°03.834	8°53.070		5667
	207	28-8	57°03.844'	8°53.075		5668
	206	28-8	57°03.860	8°53'073'		5669
	134	28-8	57°03.904'	8°53.072'	Plot placed in accordance to photo	5670
8	8	27-8	57°03.758'	8°52.644'		5653
<i>Pinus sylvestris</i>	9	27-8	57°03.721'	8°52.803'		5655
	10	27-8	57°03.753'	8°52.911'		5657
	11	27-8	57°03.747'	8°52.694'		5654
	12	27-8	57°03.742'	8°52.803'		5656
	187	22-8	57°03.844'	8°52.640'		5660
	14	28-8	57°03.812'	8°52.604'		5661
	15	28-8	57°03.796'	8°52.911'		5668
	16	28-8	57°03.829'	8°52.862'		5659
	17	28-8	57°03.780'	8°52.931'	Plot buried under a pile of wooden flakes	
9	18	30-8	57°03.746'	8°51.605'		5708
<i>Pinus sylvestris</i>	19	30-8	57°03.730'	8°51.625'		5707
	20	30-8	57°03.714'	8°51.645'		5712
	21	30-8	57°03.596'	8°51.883'		5718
	22	30-8	57°03.623'	8°51.675'		5715
	23	30-8	57°03.677	8°51.883'		5719
	24	30-8	57°03.736'	8°51.675'		5713
	25	30-8	57°03.698'	8°51.665'		5714
	26	30-8	57°03.633'	8°51.705'		5716
	27	30-8	57°03.596'	8°51.853'		5717

Appendix 2

Site no. 8, monitoring plot 8-17 & site no. 9, monitoring plot 18-27



Monitoring plot 8. The pinpoint frame is located in the center of the picture to right of the assistant almost hidden in the dense vegetation cover, photo direction north. Photo no. 5652, 27-08-2019.

Vegetation and ecological parameters in monitoring plot 8.

	15	18	15	14
Height of vegetation in cm	15	18	15	14
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	< 1	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	0	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	2°	E	1	0

Species recorded in monitoring plot 8. In the table a species is recorded the first time it has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	16	-	-
<i>Carex echinata</i>	Star Sedge	7	-	-
<i>Calluna vulgaris</i>	Heather	3	-	-
<i>Agrostis stolonifera</i>	Creeping Bent	-	+	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Carex canescens</i>	Grey Sedge	-	-	+
<i>Carex nigra</i>	Common Sedge	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Dryopteris dilatata</i>	Broad Buckler-fern	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Myrica gale</i>	Bog-myrtle	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+
<i>Scleropodium purum</i>	Neat Feather-moss	-	-	+



Monitoring plot 9. The pinpoint frame is located in the center of the picture to the right of the assistant in the dense vegetation cover, photo direction north. Photo no. 5655, 27-08-2019.

Vegetation and ecological parameters in monitoring plot 9.

	6	30	10	5
Height of vegetation in cm	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	5	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	3	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	8	SE	1	<1

Species recorded in monitoring plot 9. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	16	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	2		
<i>Dryopteris dilatata</i>	Broad Buckler-fern	1		
<i>Achillea ptarmica</i>	Sneezewort	-	-	+
<i>Agrostis stolonifera</i>	Creeping Bent	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex echinata</i>	Star Sedge	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Lysimachia europaea</i>	Chickweed-wintergreen	-	-	+
<i>Myrica gale</i>	Bog-myrtle	-	-	+
<i>Pinus sylvestris</i>	Scots Pine	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Rubus sect. Rubus</i>	Bramble	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+



Monitoring plot 10. The pinpoint frame is located in the center of the picture to the left of the assistant, photo direction north. Photo no. 5657, 27-08-2019.

Vegetation and ecological parameters in monitoring plot 10.

Height of vegetation in cm	10	14	10	11
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	25	25	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	8	SW	1	< 1

Species recorded in monitoring plot 10. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	10	-	-
<i>Calluna vulgaris</i>	Heather	7	-	-
<i>Campylopus introflexus</i>	Heath Star-moss	5	-	-
<i>Erica tetralix</i>	Cross-leaved Heath	4	-	-
<i>Dicranum scoparium</i>	Broom Moss	1	-	-
<i>Cladonia sp. s.s.</i>		-	+	-
<i>Polytrichum juniperinum</i>	Juniper Haircap	-	+	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	-	-	+
<i>Betula pubescens</i>	Downy Birch	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Myrica gale</i>	Bog-myrtle	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 11. The pinpoint frame is located in the center of the picture in the dense vegetation cover, photo direction north. Photo no. 5654, 27-08-2019.

Vegetation and ecological parameters in monitoring plot 11.

	8	6	8	25
Height of vegetation in cm	8	6	8	25
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	2	2	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0°	-	1	< 1

Species recorded in monitoring plot 11. In the table a species is recorded the first time it has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Erica tetralix</i>	Cross-leaved Heath	11	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	9	-	-
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	1	-	-
<i>Myrica gale</i>	Bog-myrtle	1	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Avenella flexuosa</i>	Wavy Hair-grass	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex echinata</i>	Star Sedge	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Lysimachia europaea</i>	Chickweed-wintergreen	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Pinus sylvestris</i>	Scots Pine	-	-	+
<i>Polytrichum juniperinum</i>	Juniper Haircap	-	-	+



Monitoring plot 12. The pinpoint frame is located in the center of the picture hidden in the dense vegetation cover at the end of the white string from the red handle in the front of the picture, photo direction north. Photo no. 5656, 27-08-2019.

Vegetation and ecological parameters in monitoring plot 12.

Height of vegetation in cm	13	15	15	20
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	1	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	0	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0°	-	2	<1

Species recorded in monitoring plot 12. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	14	-	-
<i>Myrica gale</i>	Bog-myrtle	9	-	-
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	8	-	-
<i>Dicranum scoparium</i>	Broom Moss	1	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+



Monitoring plot (43) 187. The pinpoint frame is located in the center of the picture on the northern lake shore, photo direction north. Photo no. 5660, 28-08-2019.

Vegetation and ecological parameters in monitoring plot (43) 187.

	16	40	18	25
Height of vegetation in cm				
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	20	30	0	45
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	0	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	2	S	20	0
Remarks	The monitoring plot has been moved in 2017 30 m N to cover the vegetation cover on the lakeshore.			

Species recorded in monitoring plot (43) 187. In the table a species is recorded the first time it has been recorded in the field, only

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Calluna vulgaris</i>	Heather	12	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	12	-	-
<i>Juncus effusus</i>	Common Rush	4	-	-
<i>Erica tetralix</i>	Cross-leaved Heath	2	-	-
<i>Juncus conglomeratus</i>	Compact Rush	2	-	-
<i>Myrica gale</i>	Bog-myrtle	2	-	-
<i>Bryopsida</i>	Mosses	1	-	-
<i>Achillea ptarmica</i>	Sneezewort	-	-	+
<i>Agrostis vinealis</i>	Brown Bent	-	-	+
<i>Carex oederi subsp. pulchella</i>		-	-	+
<i>Eleocharis multicaulis</i>	Many-stalked Spike-rush	-	-	+
<i>Juncus anceps</i>		-	-	+
<i>Juncus articulatus</i>	Jointed Rush	-	-	+
<i>Linaria vulgaris</i>	Common Toadflax	-	-	+
<i>Myrica gale</i>	Bog-myrtle	-	-	+
<i>Polytrichum juniperinum</i>	Juniper Haircap	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Ranunculus flammula</i>	Lesser Spearwort	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+
<i>Salix cinerea</i>	Grey Willow	-	-	+
<i>Salix repens subsp. repens var. repens</i>	Creeping Willow	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 14. The pinpoint frame is located in the center of the picture nearly hidden in the dense vegetation cover, photo direction north. Photo no. 5661, 28-08-2019.

Vegetation and ecological parameters in monitoring plot 14.

Height of vegetation in cm		10	10	25
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	0	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	30	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	5	NE	1	<1

Species recorded in monitoring plot 14. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Calluna vulgaris</i>	Heather	13	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	3	-	-
<i>Carex arenaria</i>	Sand Sedge	1	-	-
<i>Juncus effusus</i>	Common Rush	1	-	-
<i>Juncus squarrosus</i>	Heath Rush	1	-	-
<i>Polytrichum juniperinum</i>	Juniper Haircap	1	-	-
	Naked soil	1	-	-
<i>Achillea ptarmica</i>	Sneezewort	-	-	+
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Agrostis vinealis</i>	Brown Bent	-	-	+
<i>Euphrasia stricta</i>	Eyebright	-	-	+
<i>Hieracium umbellatum</i>	Narrowleaf Hawkweed	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus anceps</i>		-	-	+
<i>Juncus conglomeratus</i>	Compact Rush	-	-	+
<i>Luzula multiflora</i>	Heath Wood-rush	-	-	+
<i>Myrica gale</i>	Bog-myrtle	-	-	+
<i>Phragmites australis</i>	Reed	-	-	+
<i>Pinus sylvestris</i>	Scots Pine	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Prunus sp.</i>		-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Salix repens subsp. repens var. arenaria</i>	Willow	-	-	+
<i>Salix repens subsp. repens var. repens</i>	Creeping Willow	-	-	+
<i>Scorzonerooides autumnalis</i>	Autumn Hawkbit	-	-	+



Monitoring plot 15. The pinpoint frame is located in the center of the picture to the left of the assistant, photo direction north. Photo no. 5658, 28-08-2019.

Vegetation and ecological parameters in monitoring plot 15.

Height of vegetation in cm		22	20	25
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	1	10	0	20
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	<1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	8	NW	<1	0

Species recorded in monitoring plot 15. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	16	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	6	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	3	-	-
<i>Dryopteris dilatata</i>	Broad Buckler-fern	2	-	-
<i>Erica tetralix</i>	Cross-leaved Heath	1	-	-
<i>Agrostis capillaris</i>	Common Bent	-	+	-
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	+	-
<i>Argentina anserina</i>	Silverweed	-	-	+
<i>Bryopsida</i>	Mosses	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Cirsium arvense</i>	Creeping Thistle	-	-	+
<i>Galeopsis bifida</i>	Bifid Hemp-nettle	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Juncus conglomeratus</i>	Compact Rush	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Myrica gale</i>	Bog-myrtle	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Rubus sect. Rubus</i>	Bramble	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+



Monitoring plot 16. The pinpoint frame is located in the center of the picture hidden in the dense vegetation cover, photo direction north. Photo no. 5659, 28-08-2019.

Vegetation and ecological parameters in monitoring plot 16.

Height of vegetation in cm		15	50	20	30
	Dwarf shrub		Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	5	< 1	0	0	50
	Bare soil		Bare sand	Dead wood	
Cover in m ²	0	0	0	0	
Light penetration	96	96	96	96	96
	Inclination		Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0°	-		< 1	<1

Species recorded in monitoring plot 16. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	-	-	+
<i>Juncus effusus</i>	Common Rush	7	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	4	-	-
	Litter	3	-	-
	Water	3	-	-
<i>Myrica gale</i>	Bog-myrtle	-	-	+
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Agrostis sp.</i>	Bent	-	-	+
<i>Calluna vulgaris</i>	Heath Star-moss	-	-	+
<i>Campylopus introflexus</i>	Narrow Buckler-fern	-	-	+
<i>Dryopteris carthusiana</i>	Cross-leaved Heath	-	-	+
<i>Luzula multiflora</i>	Heath Wood-rush	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Rhytidiadelphus squarrosus</i>	Springy Tuff-moss	-	-	+
<i>Rumex acetosa</i>	Common Sorrel	-	-	+
<i>Salix cinerea</i>	Grey Willow	-	-	+
<i>Viola palustris</i>	Marsh Violet	-	-	+

Monitoring plot 17 buried under a huge pile of wooden flakes and therefore not analyzed 28-08-2019.



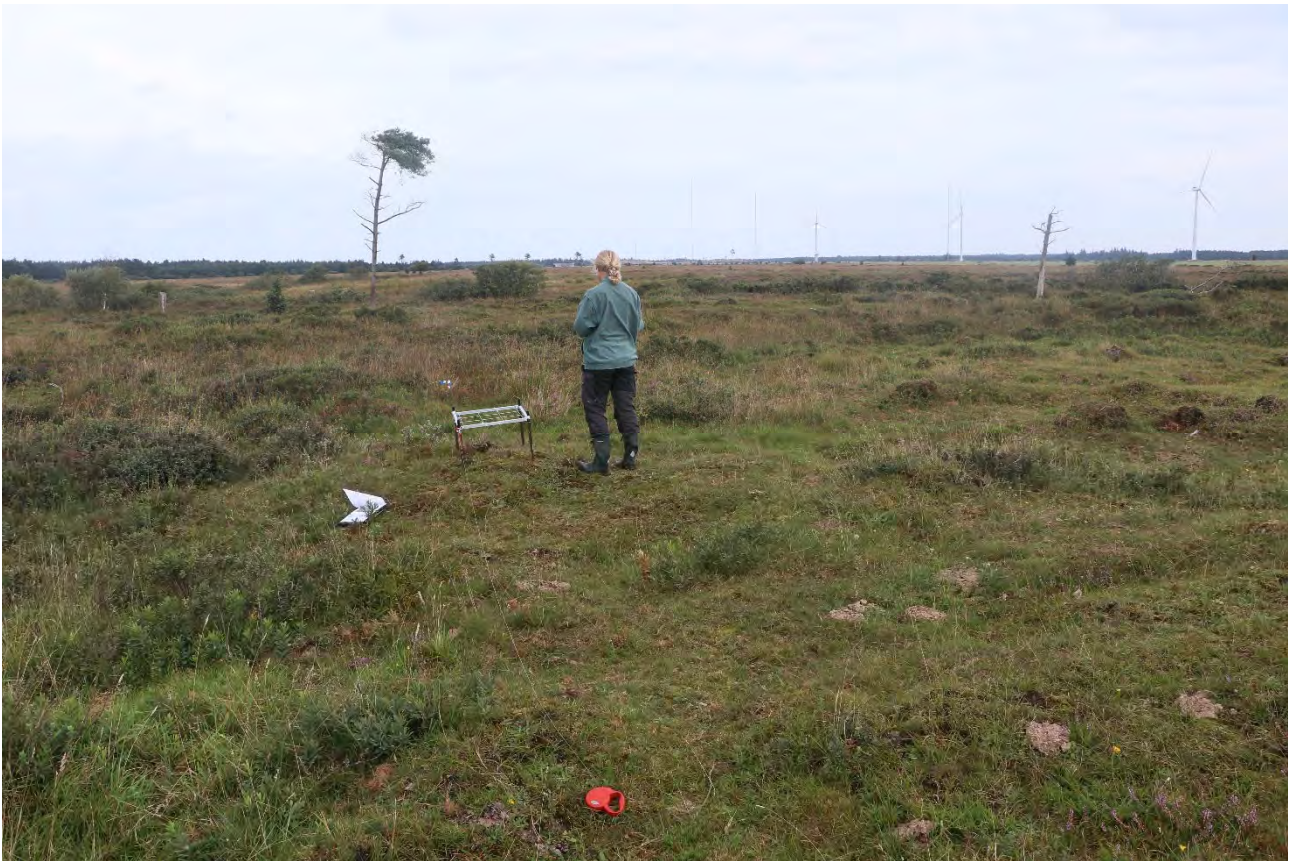
Monitoring plot 18. The pinpoint frame is located in the center of the picture at the end of the white string nearly hidden behind the scrub, photo direction north. Photo no. 5708, 30-08-2019.

Vegetation and ecological parameters in monitoring plot 18.

	7	20	5	10
Height of vegetation in cm	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	1	10	0	33
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	10°	E	1	<1

Species recorded in monitoring plot 18. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	7	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	4	-	-
	Water	3	-	-
<i>Juncus effusus</i>	Common Rush	1	-	-
<i>Salix aurita</i>	Eared Willow	1	-	-
	Litter	1	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Agrostis stolonifera</i>	Creeping Bent	-	-	+
<i>Betula pubescens</i>	Downy Birch	-	-	+
<i>Bryopsida</i>	Mosses	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex panicea</i>	Carnation Sedge	-	-	+
<i>Cerastium fontanum</i> subsp. <i>vulgare</i> var. <i>vulgare</i>	Common Mouse-ear	-	-	+
<i>Cladonia chlorophaea</i> agg.		-	-	+
<i>Cladonia</i> sp.		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus bulbosus</i>	Bulbous Rush	-	-	+
<i>Juncus filiformis</i>	Thread Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Myrica gale</i>	Bog-myrtle	-	-	+
<i>Polypodium vulgare</i>	Polypodium	-	-	+
<i>Prunus serotina</i>	Wild Black Cherry	-	-	+
<i>Polytrichum juniperinum</i>	Juniper Haircap	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Tortula</i> sp.		-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 19. The pinpoint frame is located in the center of the picture in the open, grazed vegetation cover, photo direction north. Photo no. 5707, 30-08-2019.

Vegetation and ecological parameters in monitoring plot 19.

Height of vegetation in cm2		4	2	2
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	5	5	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	2°	SW	5	<1

Species recorded in monitoring plot 19. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	9	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	7	-	-
<i>Carex arenaria</i>	Sand Sedge	4	-	-
<i>Calluna vulgaris</i>	Heather	2	-	-
<i>Bryopsida</i>	Mosses	1	-	-
<i>Campylopus introflexus</i>	Heath Star-moss	1	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	1	-	-
<i>Polytrichum juniperinum</i>	Juniper Haircap	1	-	-
<i>Cladonia chlorophaea</i> agg.		-	+	-
<i>Galium saxatile</i>	Heath Bedstraw	-	+	-
<i>Marcanthiopsida</i>		-	+	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Carex nigra</i>	Common Sedge	-	-	+
<i>Cerastium fontanum</i> subsp. <i>vulgare</i> var. <i>vulgare</i>	Common Mouse-ear	-	-	+
<i>Cladonia</i> sp.		-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypnum cupressiforme/jutlandicum</i>	Cypress-leaved Plait-moss	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Myrica gale</i>	Bog-myrtle	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Quercus robur</i>	Pedunculate Oak	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Scleropodium purum</i>	Neat Feather-moss	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+
<i>Veronica officinalis</i>	Heath Speedwell	-	-	+



Monitoring plot 20. The pinpoint frame is located in the center of the picture in the open, grazed vegetation cover to the left of the assistant, photo direction north. Photo no. 5712, 22-08-2017

Vegetation and ecological parameters in monitoring plot 20.

Height of vegetation in cm5		4	2	2
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	10	2	<1	1
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	9°	N	1	<1

Species recorded in monitoring plot 20. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	13	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	5	-	-
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	4	-	-
<i>Calluna vulgaris</i>	Heather	1	-	-
<i>Carex arenaria</i>	Sand Sedge	1	-	-
<i>Campylopus introflexus</i>	Heath Star-moss	1	-	-
<i>Carex nigra</i>	Common Sedge	1	-	-
<i>Dicranum scoparium</i>	Broom Moss	1	-	-
<i>Erica tetralix</i>	Cross-leaved Heath	1	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	-	+	-
<i>Potentilla erecta</i>	Tormentil	-	+	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Carex pilulifera</i>	Pill Sedge	-	-	+
<i>Cerastium fontanum subsp. vulgare</i> <i>var. vulgare</i>	Common Mouse-ear	-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Myrica gale</i>	Bog-myrtle	-	-	+
<i>Pinus sylvestris</i>	Scots Pine	-	-	+
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	-	-	+
<i>Polytrichum juniperinum</i>	Juniper Haircap	-	-	+
<i>Rumex acetosa</i>	Common Sorrel	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+
<i>Salix repens subsp. repens var. repens</i>	Creeping Willow	-	-	+
<i>Scleropodium purum</i>	Neat Feather-moss	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 21. The pinpoint frame is located in the center of the picture in the open vegetation cover to the right of the assistant, photo direction north. Photo no. 5718, 30-08-2019.

Vegetation and ecological parameters in monitoring plot 21.

Height of vegetation in cm5		6	2	1
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	< 1	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	6°	SE	< 1	0

Species recorded in monitoring plot 21. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Carex arenaria</i>	Sand Sedge	8	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	7	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	3	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	2	-	-
	Litter	2	-	-
<i>Dicranum scoparium</i>	Broom Moss	1	-	-
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-Moss	1	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Bryopsida</i>	Mosses	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Cerastium fontanum subsp. vulgare</i> <i>var. vulgare</i>	Common Mouse-ear	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Rumex acetosa</i>	Common Sorrel	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Scleropodium purum</i>	Neat Feather-moss	-	-	+
<i>Sorbus intermedia</i>	Swedish Whitebeam	-	-	+
<i>Stellaria media</i>	Common Chickweed	-	-	+



Monitoring plot 22. The pinpoint frame is located to the left of the center of the picture in the open, grazed vegetation cover, photo direction north. Photo no. 5715, 30-08-2019.

Vegetation and ecological parameters in monitoring plot 22.

Height of vegetation in cm5		2	8	1
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	50	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	1	<1	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	5°	SE	5	<1

Species recorded in monitoring plot 22. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Calluna vulgaris</i>	Heather	9	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	8	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	4	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	1	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	-	+	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Betula pubescens</i>	Downy Birch	-	-	+
<i>Bryopsida</i>	Mosses	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Carex arenaria</i>	Sand Sedge	-	-	+
<i>Carex pilulifera</i>	Pill Sedge	-	-	+
<i>Cerastium fontanum</i> subsp. <i>vulgare</i> var. <i>vulgare</i>	Common Mouse-ear	-	-	+
<i>Cirsium vulgare</i>	Spear Thistle	-	-	+
<i>Cladonia chlorophaea</i> agg.		-	-	+
<i>Cladonia</i> sp.		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Scorzoneroides autumnalis</i>	Autumn Hawkbit	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 23. The pinpoint frame is located in the center of the picture in the open, grazed vegetation cover, photo direction north. Photo no. 5719, 30-08-2019.

Vegetation and ecological parameters in monitoring plot 23.

	15	5	1	5
Height of vegetation in cm	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	30	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0°	-	< 1	0

Species recorded in monitoring plot 23. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	12	-	-
<i>Vaccinium uliginosum</i>	Bog Bilberry	6	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	5	-	-
<i>Carex pilulifera</i>	Pill Sedge	2	-	-
<i>Potentilla erecta</i>	Tormentil	2	-	-
<i>Dicranum scoparium</i>	Broom Moss	1	-	-
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	1	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	1	-	-
<i>Betula pubescens</i>	Downy Birch	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex arenaria</i>	Sand Sedge	-	-	+
<i>Cerastium fontanum subsp. vulgare var. vulgare</i>	Common Mouse-ear	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Myrica gale</i>	Bog-myrtle	-	-	+
<i>Polygala serpyllifolia</i>	Heath Milkwort	-	-	+
<i>Rumex acetosa</i>	Common Sorrel	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Salix repens subsp. repens var. repens</i>	Creeping Willow	-	-	+
<i>Trichophorum cespitosum subsp. germanicum</i>	Deergrass	-	-	+



Monitoring plot 24. The pinpoint frame is located in the center of the picture in the open, grazed vegetation cover, photo direction north. Photo no. 5713, 22-08-2017.

Vegetation and ecological parameters in monitoring plot 24.

	5	2	5	5
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	1	1	0	1
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	<1	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0°	-	< 1	0

Species recorded in monitoring plot 24. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	11	-	-
	Naked soil	4	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	3	-	-
<i>Agrostis vinealis</i>	Brown Bent	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Carex echinata</i>	Star Sedge	-	-	+
<i>Carex pilulifera</i>	Pill Sedge	-	-	+
<i>Carex panicea</i>	Carnation Sedge	-	-	+
<i>Cerastium fontanum</i> subsp. <i>vulgare</i> var. <i>vulgare</i>	Common Mouse-ear	-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Eriophorum angustifolium</i>	Common Cottongrass	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	-	-	+
<i>Juncus articulatus</i>	Jointed Rush	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Myrica gale</i>	Bog-myrtle	-	-	+
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	-	-	+
<i>Poa annua</i>	Annual Meadow-grass	-	-	+
<i>Polygala serpyllifolia</i>	Heath Milkwort	-	-	+
<i>Polytrichum juniperinum</i>	Juniper Haircap	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+



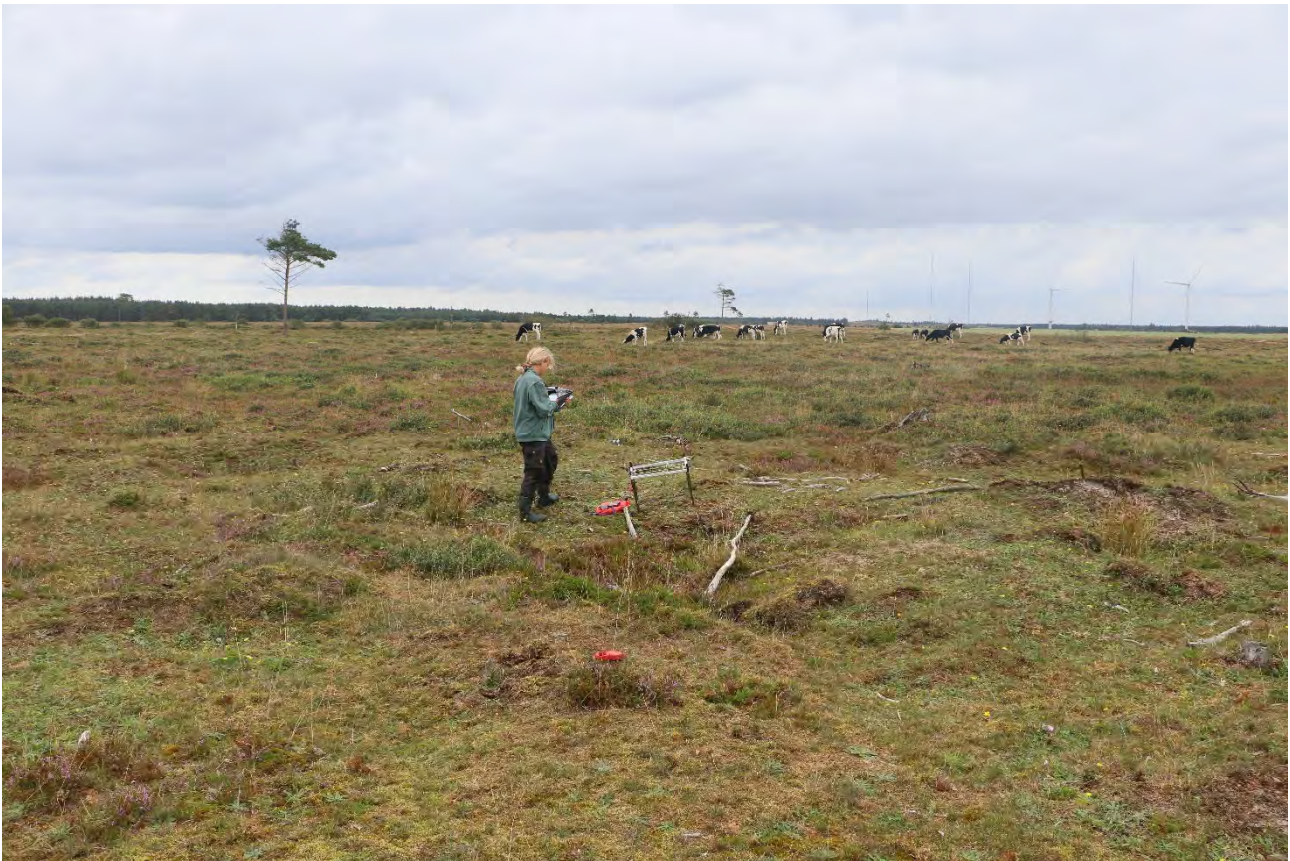
Monitoring plot 25. The pinpoint frame is located in the center of the picture in the open, grazed vegetation cover to the left of the assistant, photo direction north. Photo no. 5714, 22-08-2017.

Vegetation and ecological parameters in monitoring plot 25.

Height of vegetation in cm	3	0	4	2
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	1	<1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	< 1	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	8°	NE	5	< 1

Species recorded in monitoring plot 25. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	13	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	6	-	-
<i>Polytrichum juniperinum</i>	Juniper Haircap	1	-	-
	Litter	1	-	-
	Naked soil	1	-	-
<i>Carex arenaria</i>	Sand Sedge	-	+	-
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Carex pilulifera</i>	Pill Sedge	-	-	+
<i>Cerastium fontanum</i> subsp. <i>vulgare</i> var. <i>vulgare</i>	Common Mouse-ear	-	-	+
<i>Cladonia chlorophaea</i> agg.		-	-	+
<i>Cladonia portentosa</i>		-	-	+
<i>Cladonia</i> sp. s.s.		-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Salix repens</i> subsp. <i>repens</i> var. <i>repens</i>	Creeping Willow	-	-	+
<i>Scleropodium purum</i>	Neat Feather-moss	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 26. The pinpoint frame is located in the center of the picture in the open, grazed vegetation cover to the right of the assistant, photo direction north. Photo no. 5716, 30-08-2019.

Vegetation and ecological parameters in monitoring plot 26.

	1	2	2	1
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	3	<1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	<1	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	8°	W	2	0

Species recorded in monitoring plot 26. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	4	-	-
	Litter	3	-	-
<i>Campylopus introflexus</i>	Heath Star-moss	2	-	-
<i>Bryopsida</i>	Mosses	1	-	-
<i>Calluna vulgaris</i>	Heather	1	-	-
<i>Carex arenaria</i>	Sand Sedge	1	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	1	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	1	-	-
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-Moss	1	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	1	-	-
	Sand	1	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Salix repens subsp. repens var. repens</i>	Creeping Willow	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 27. The pinpoint frame is located in the center of the picture in the open, grazed vegetation cover, photo direction north. Photo no. 5717, 30-08-2019

Vegetation and ecological parameters in monitoring plot 27.

Height of vegetation in cm	1	2	4	0
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	1	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	1	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0	-	2	0

Species recorded in monitoring plot 27. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	10	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	8	-	-
<i>Carex arenaria</i>	Sand Sedge	7	-	-
<i>Bryopsida</i>	Mosses	4	-	-
<i>Calluna vulgaris</i>	Heather	2	-	-
<i>Bryophyte (collected)</i>		1	-	-
	Naked soil	1	-	-
<i>Rumex acetosella</i>	Sheep's Sorrel	-	+	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Carex pilulifera</i>	Pill Sedge	-	-	+
<i>Cerastium fontanum subsp. vulgare</i> <i>var. vulgare</i>	Common Mouse-ear	-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	-	-	+
<i>Salix repens subsp. repens var. repens</i>	Creeping Willow	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+

Appendix 3

Site no. 6, monitoring plot 29-67 & site no. 2, monitoring plot 68-77



Monitoring plot 29. The pinpoint frame is located in the center of the picture in the semi-open vegetation cover to the left of the assistant, photo direction north. Photo no. 5683, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 29.

Height of vegetation in cm	9	9	6	12
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	20	< 1	0	1
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	0	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	6°	E	20	<1

Species recorded in monitoring plot 29. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Calluna vulgaris</i>	Heather	9	-	-
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	8	-	-
<i>Eriophorum angustifolium</i>	Common Cottongrass	6	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	4	-	-
<i>Dicranum scoparium</i>	Broom Moss	3	-	-
<i>Erica tetralix</i>	Cross-leaved Heath	2	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	2	-	-
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Persicaria lapathifolia subsp. pallida</i>	Pale Persicaria	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Polytrichum juniperinum</i>	Juniper Haircap	-	-	+
<i>Prunus serotina</i>	Wild Black Cherry	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Trifolium repens</i>	White Clover	-	-	+



Monitoring plot 30. The pinpoint frame is located in the center of the picture in the semi-open vegetation cover, photo direction north. Photo no. 5680, 28-08-2019.

Vegetation and ecological parameters in monitoring plot 30.

	4	3	8	6
Height of vegetation in cm				
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	<1	0	0	1
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	8	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	2	SE	<1	<1

Species recorded in monitoring plot 30. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	13	-	-
<i>Rumex acetosella</i>	Sheep's Sorrel	3	-	-
	Sand	2	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	-	-	+
<i>Bryopsida</i>	Mosses	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex echinata</i>	Star Sedge	-	-	+
<i>Carex pilulifera</i>	Pill Sedge	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Eriophorum angustifolium</i>	Common Cottongrass	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Persicaria lapathifolia</i> subsp. <i>pallida</i>	Pale Persicaria	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Spergula arvensis</i>	Sea-spurreys	-	-	+



Monitoring plot 31. The pinpoint frame is located in the center of the picture in the semi-open vegetation cover, photo direction north. 28-08-2019.

Vegetation and ecological parameters in monitoring plot 31.

Height of vegetation in cm	0	0	0	15
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	<1	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	50	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	4	SW	0	0
Remarks	The plot was heavily affected by the construction work of the new road			

Species recorded in monitoring plot 31. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
	Sand	7	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	6	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	3	-	-
<i>Rumex acetosella</i>	Sheep's Sorrel	1	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex arenaria</i>	Sand Sedge	-	-	+
<i>Carex echinata</i>	Star Sedge	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Eriophorum angustifolium</i>	Common Cottongrass	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Persicaria lapathifolia</i> subsp. <i>pallida</i>	Pale Persicaria	-	-	+
<i>Scorzonerooides autumnalis</i>	Autumn Hawkbit	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Spergula arvensis</i>	Sea-spurreys	-	-	+



Monitoring plot 35. The pinpoint frame is located in the center of the picture in the open vegetation cover to the right of the assistant, photo direction north. Photo no. 5686, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 35.

	3	0	22	4
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	<1	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	16	2	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	4°	W	< 1	0
Remarks	The plot was heavily affected by the construction work of the new road			

Species recorded in monitoring plot 35. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	11	-	-
	Sand	4	-	-
<i>Carex arenaria</i>	Sand Sedge	4	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	2	-	-
	Litter	1	-	-
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cytisus scoparius</i>	Broom	-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Pericaria lapathifolia subsp. pallida</i>	Pale Persicaria	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	-
<i>Salix aurita</i>	Eared Willow	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Spergula arvensis</i>	Sea-spurreys	-	-	+



Monitoring plot 37. The pinpoint frame is located in the center of the picture halfway hidden in the dense vegetation cover, photo direction north. Photo no. 5687, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 37.

Height of vegetation in cm	10	0	5	10
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	33	<1	0	1
	Bare soil	Bare sand	Dead wood	
Cover in m ²	1	0	<1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	7°	SE	<1	0
Remarks	The monitoring plot was partly affected by work construction			

Species recorded in monitoring plot 37. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Calluna vulgaris</i>	Heather	11	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	6	-	-
<i>Erica tetralix</i>	Cross-leaved Heath	3	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	3	-	-
<i>Carex arenaria</i>	Sand Sedge	2	-	-
<i>Rumex acetosella</i>	Sheep's Sorrel	2	-	-
	Dead wood	2	-	-
<i>Agrostis vinealis</i>	Brown Bent	-	-	+
<i>Bryopsida</i>	Mosses	-	-	+
<i>Carex echinata</i>	Star Sedge	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Persicaria lapathifolia subsp. pallida</i>	Pale Persicaria	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+



Monitoring plot 38. The pinpoint frame is located in the center of the picture to the left of the assistant, photo direction north. Photo no. 5688, 29-08-2017.

Vegetation and ecological parameters in monitoring plot 38.

Height of vegetation in cm3		5	15	2
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	15	<1	0	1
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	2	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	2°	N	5	<1

Species recorded in monitoring plot 38. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	15	-	-
<i>Calluna vulgaris</i>	Heather	6	-	-
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	3	-	-
<i>Campylopus introflexus</i>	Heath Star-moss	1	-	-
<i>Carex arenaria</i>	Sand Sedge	1	-	-
<i>Rumex acetosella</i>	Sheep's Sorrel	1	-	-
	Dead wood	1	-	-
<i>Agrostis sp.</i>	Bent	-	-	+
<i>Carex nigra</i>	Common Sedge	-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Pinus sylvestris</i>	Scots Pine	-	-	+
<i>Quercus robur</i>	Pedunculate Oak	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Spergula arvensis</i>	Sea-spurreys	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 40. The pinpoint frame is located in the center of the picture in the semi-open vegetation cover, photo direction north. Photo no. 5672, 28-08-2019

Vegetation and ecological parameters in monitoring plot 40.

	9	10	5	6
Height of vegetation in cm	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	25	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	<1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0°	-	<1	<1

Species recorded in monitoring plot 40. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	16	-	-
<i>Erica tetralix</i>	Cross-leaved Heath	5	-	-
<i>Calluna vulgaris</i>	Heather	4	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	2	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Carex arenaria</i>	Sand Sedge	-	-	+
<i>Carex pilulifera</i>	Pill Sedge	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Quercus robur</i>	Pedunculate Oak	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+



Monitoring plot 41. The pinpoint frame is located in the center of the picture in the semi-open vegetation cover to the right of the assistant, photo direction north. Photo no. 5673, 28-08-2019.

Vegetation and ecological parameters in monitoring plot 41.

	23	7	5	11
Height of vegetation in cm	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	7	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	2	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	2°	E	4	<1

Species recorded in monitoring plot 41. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	15	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	13	-	-
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	4	-	-
<i>Calluna vulgaris</i>	Heather	3	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	1	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Bryopsida</i>	Mosses	-	-	+
<i>Carex arenaria</i>	Sand Sedge	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Luzula multiflora</i>	Heath Wood-rush	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Pinus sylvestris</i>	Scots Pine	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Quercus robur</i>	Pedunculate Oak	-	-	+
<i>Rubus sect. Rubus</i>	Bramble	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+



Monitoring plot 42. The pinpoint frame is located in the center of the picture in the semi-open vegetation cover to the right of the assistant, photo direction north. Photo no. 5671, 28-08-2019.

Vegetation and ecological parameters in monitoring plot 42.

	16	11	20	18
Height of vegetation in cm	16	11	20	18
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	7	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	<1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	6°	SE	1	<1

Species recorded in monitoring plot 42. In the table a species is recorded the first time it has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	16	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	11	-	-
<i>Campylopus introflexus</i>	Heath Star-moss	1	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 46. The pinpoint frame is located in the center of the picture nearly hidden in the dense vegetation cover, photo direction north. Photo no. 5689, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 46.

Height of vegetation in cm	40	0	12	20
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	<1	0	0	75
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0°	-	<1	0

Species recorded in monitoring plot 46. In the table a species is recorded the first time it has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Eriophorum angustifolium</i>	Common Cottongrass	11	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	5	-	-
	Open water	2	-	-
<i>Juncus effuses</i>	Common Rush	1	-	-
<i>Bryopsida</i>	Mosses	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Juncus filiformis</i>	Thread Rush	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+



Monitoring plot 51. The pinpoint frame is located in the center of the picture halfway hidden in the semi-dense vegetation cover, photo direction north. Photo no. 5677, 28-08-2019.

Vegetation and ecological parameters in monitoring plot 51.

Height of vegetation in cm	10	5	10	10
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	15	<1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0°	-	< 1	< 1

Species recorded in monitoring plot 51. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	16	-	-
<i>Calluna vulgaris</i>	Heather	3	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Bryopsida</i>	Mosses	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Carex pilulifera</i>	Pill Sedge	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Lysimachia europaea</i>	Chickweed-wintergreen	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Rumex acetosa</i>	Common Sorrel	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+



Monitoring plot 52. The pinpoint frame is located in the center of the picture almost hidden in the dense vegetation cover, photo direction north. Photo no. 5674, 28-08-2019.

Vegetation and ecological parameters in monitoring plot 52.

	10	10	20	25
Height of vegetation in cm	10	10	20	25
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	2	<1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	0	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	5°	W	1	<1

Species recorded in monitoring plot 52. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	16	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	5	-	-
<i>Carex arenaria</i>	Sand Sedge	4	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Prunus serotina</i>	Wild Black Cherry	-	-	+
<i>Quercus robur</i>	Pedunculate Oak	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+



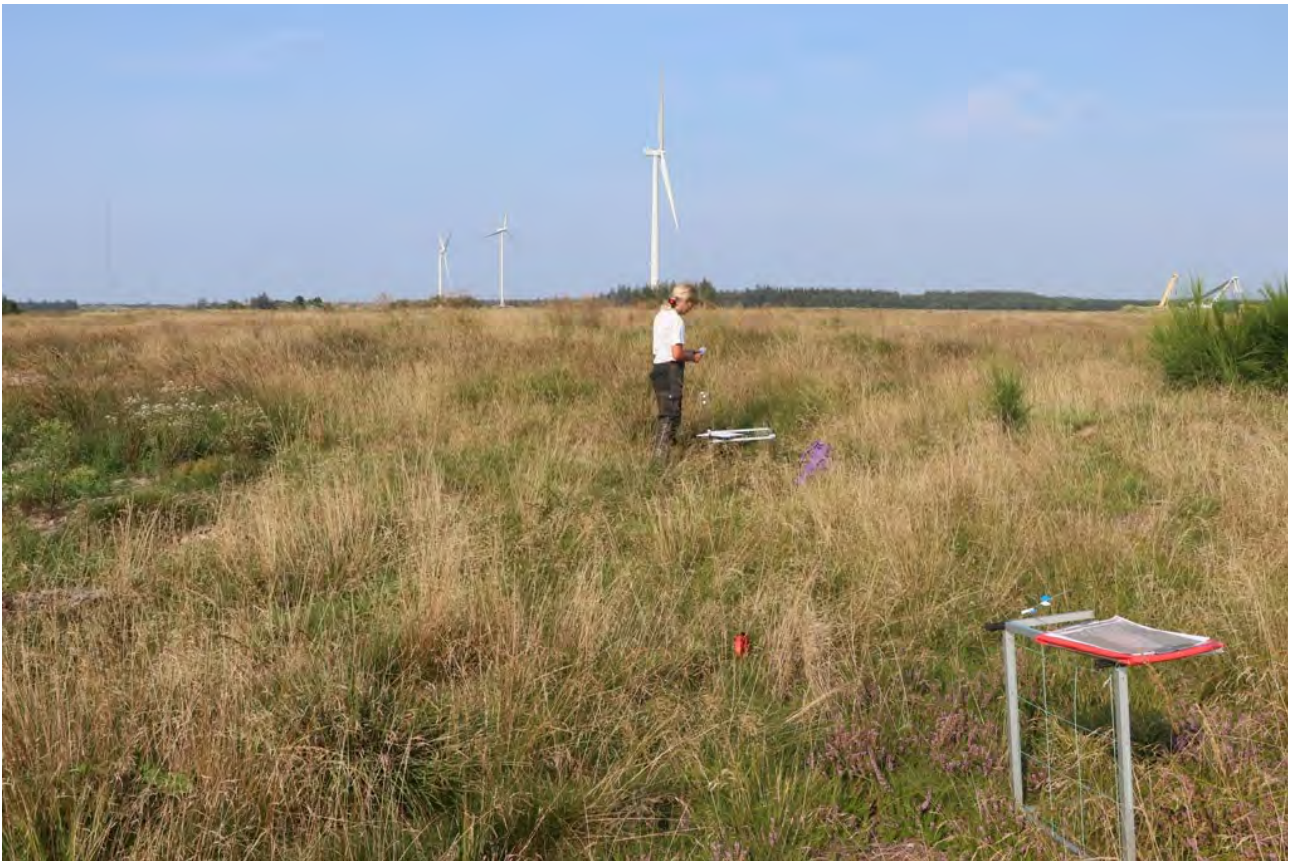
Monitoring plot 57. The pinpoint frame is located in the center of the picture halfway hidden in the semi-dense vegetation cover to the left of the assistant, photo direction north. Photo no 5678, 28-08-2019.

Vegetation and ecological parameters in monitoring plot 57.

	9	7	8	7
Height of vegetation in cm	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	2	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	2	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	4°	SW	1	<1

Species recorded in monitoring plot 57. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	16	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	7	-	-
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	1	-	-
<i>Agrostis stolonifera</i>	Creeping Bent	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Luzula multiflora</i>	Heath Wood-rush	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+



Monitoring plot 59. The pinpoint frame is located in the center of the picture in open vegetation cover to the right of the assistant, photo direction north. Photo no. 5676, 28-08-2019.

Vegetation and ecological parameters in monitoring plot 59..

	34	5	4	8
Height of vegetation in cm	34	5	4	8
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	1	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	2	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	2°	W	1	<1

Species recorded in monitoring plot 59. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	16	-	-
<i>Agrostis capillaris</i>	Common Bent	2	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	2	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	1	-	-
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex arenaria</i>	Sand Sedge	-	-	+
<i>Cerastium fontanum subsp. vulgare</i> var. <i>Vulgare</i>	Common Mouse-ear	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Cytisus scoparius</i>	Broom	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Persicaria lapathifolia subsp. pallida</i>	Pale Persicaria	-	-	+
<i>Polygonum aviculare</i>	Knotgrass	-	-	+
<i>Polytrichum commune</i>	Common Haircap	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+



Monitoring plot (65) 191. The pinpoint frame is located in the center of the picture in the open vegetation cover, photo direction north. Photo no. 5684, 29-08-2019.

Vegetation and ecological parameters in monitoring plot (65) 191.

Height of vegetation in cm	18	12	10	11
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	50	< 1	0	<1
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	1	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	10°	SE	1	<1
Remarks	The original monitoring plot was too close to a ditch covered with <i>Juncus effusus</i> . The monitoring plot has been moved 10 m N and renamed monitoring plot 191.			

Species recorded in monitoring plot (65) 191. In the table a species is recorded the first time it has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Calluna vulgaris</i>	Heather	13	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	7	-	-
<i>Betula pubescens</i>	Downy Birch	-	-	+
<i>Bryopsida</i>	Mosses	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Carex nigra</i>	Common Sedge	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Eriophorum angustifolium</i>	Common Cottongrass	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Rumex acetosa</i>	Common Sorrel	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Trifolium repens</i>	White Clover	-	-	+



Monitoring plot (66) 190. The pinpoint frame is located in the center of the picture in the open vegetation cover to the right of the assistant, photo direction north. Photo no. 5682, 28-08-2019.

Vegetation and ecological parameters in monitoring plot (66) 190.

	45	14	16	20
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	4	< 1	0	8
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	0	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0°	-	3	<1
Remarks	The original monitoring plot was too close to a ditch covered with <i>Juncus effusus</i> . The monitoring plot has been moved 10 m N and renamed monitoring plot 190.			

Species recorded in monitoring plot (66) 190. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	16	-	-
<i>Calluna vulgaris</i>	Heather	7	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	4	-	-
<i>Erica tetralix</i>	Cross-leaved Heath	4	-	-
<i>Polytrichum commune</i>	Common Haircap	1	-	-
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Eriophorum angustifolium</i>	Common Cottongrass	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Persicaria lapathifolia subsp. pallida</i>	Pale Persicaria	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Pinus sylvestris</i>	Scots Pine	-	-	+
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Quercus robur</i>	Pedunculate Oak	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Spergula arvensis</i>	Sea-spurreys	-	-	+



Monitoring plot (67) 189. The pinpoint frame is located in the center of the picture in the open, disturbed vegetation cover, photo direction north. Photo no. 5679, 28-08-2019.

Vegetation and ecological parameters in monitoring plot (67) 189.

Height of vegetation in cm	0	4	4	9
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	< 1	0	0	<1
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	66	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0°	-	0	0
Remarks	The original monitoring plot was too close to a ditch covered with <i>Juncus effusus</i> . The monitoring plot has been moved 10 m N and renamed monitoring plot 189. The monitoring plot is heavily affected by the road construction work.			

Species recorded in monitoring plot (67) 189. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	7	-	-
<i>Rumex acetosella</i>	Sheep's Sorrel	6	-	-
	Sand	3	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	2	-	-
<i>Agrostis gigantea</i>	Black Bent	-	-	+
<i>Argentina anserina</i>	Silverweed	-	-	+
<i>Avenella flexuosa</i>	Wavy Hair-grass	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex pilulifera</i>	Pill Sedge	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Persicaria lapathifolia</i> subsp. <i>pallida</i>	Pale Persicaria	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Spergula arvensis</i>	Sea-spurreys	-	-	+



Monitoring plot (68) 200. The pinpoint frame is located in the center of the picture at the end of the white string almost hidden in the dense vegetation cover, photo direction north. Photo no. 5651, 27-08-2019.

Vegetation and ecological parameters in monitoring plot (68) 200.

Height of vegetation in cm	15	30	15	20
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	2	< 1	0	1
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0°	-	<1	0
Remarks	The monitoring plot has been moved 50 m W because of the erection of an impassable fence and renamed monitoring plot 200.			

Species recorded in monitoring plot 68. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Carex echinata</i>	Star Sedge	13	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	8	-	-
<i>Juncus anceps</i>		-	+	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Agrostis gigantea</i>	Black Bent	-	-	+
<i>Avenella flexuosa</i>	Wavy Hair-grass	-	-	+
<i>Bryopsida</i>	Mosses	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex nigra</i>	Common Sedge	-	-	+
<i>Cerastium fontanum subsp. vulgare</i> <i>var. vulgare</i>	Common Mouse-ear	-	-	+
<i>Epilobium montanum</i>	Broad-leaved Willowherb	-	-	+
<i>Epilobium palustre</i>	Marsh Willowherb	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Eriophorum angustifolium</i>	Common Cottongrass	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus conglomeratus</i>	Compact Rush	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Juncus filiformis</i>	Thread Rush	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Pinus sylvestris</i>	Scots Pine	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot (69) 199. The pinpoint frame is located in the center of the picture in the semi-dense vegetation cover to the right of the assistant, photo direction north. Photo no. 5652, 27-08-2018.

Vegetation and ecological parameters in monitoring plot (69) 199.

Height of vegetation in cm	15	18	14	12
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	5	2	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	15	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	6°	SW	20	<1
Remarks	The monitoring plot has been moved 100 m W because of the establishment of an impassable fence and renamed monitoring plot 199.			

Species recorded in monitoring plot (69) 199. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	16	-	-
<i>Campylopus introflexus</i>	Heath Star-moss	2	-	-
<i>Bryopsida</i>	Mosses	2	-	-
<i>Cladonia chlorophaea agg.</i>	Heath Star-moss	1	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	1	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Betula pubescens</i>	Downy Birch	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex nigra</i>	Common Sedge	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Luzula multiflora</i>	Heath Wood-rush	-	-	+
<i>Lysimachia europaea</i>	Chickweed-wintergreen	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Pinus sylvestris</i>	Scots Pine	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+



Monitoring plot 70. The pinpoint frame is located in the center of the picture in the semi-dense vegetation cover, photo direction north. Photo no. 5650, 27-08-2019.

Vegetation and ecological parameters in monitoring plot 70.

	19	3	17	17
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	10	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	4°	NW	5	< 1

Species recorded in monitoring plot 70. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	15	-	-
<i>Carex nigra</i>	Common Sedge	7	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	7	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	2	-	-
<i>Scleropodium purum</i>	Neat Feather-moss	1	-	-
<i>Bryopsida</i>	Mosses	-	+	-
<i>Cladonia sp. s.s.</i>		-	+	-
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Bidens tripartita</i>	Trifid Bur-marigold	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Juncus conglomeratus</i>	Compact Rush	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Pinus sylvestris</i>	Scots Pine	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 75. The pinpoint frame is located in the center of the picture at the end of the white string in the semi-dense vegetation cover, photo direction north. Photo no. 5649, 27-08-2019.

Vegetation and ecological parameters in monitoring plot 75.

	7	8	12	7
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	33	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0°	-	1	0
Remark	The pinpoint frame was laid out by use of the photo from 2017 as the information of the GPS was too imprecisely given many contra dictionary directions			

Species recorded in monitoring plot 75. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	10	-	-
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	8	-	-
<i>Vaccinium uliginosum</i>	Bog Bilberry	8	-	-
<i>Calluna vulgaris</i>	Heather	6	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	3	-	-
<i>Scleropodium purum</i>	Neat Feather-moss	3	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	1	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Betula pubescens</i>	Downy Birch	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus conglomeratus</i>	Compact Rush	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Luzula multiflora</i>	Heath Wood-rush	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Pinus sylvestris</i>	Scots Pine	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+



Monitoring plot 77. The pinpoint frame is located in the center of the picture at the end of the tramped path in the dense vegetation cover to the right of the assistant, photo direction north. Photo no. 5648, 27-08-2019.

Vegetation and ecological parameters in monitoring plot 77.

	45	35	22	37
Height of vegetation in cm	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	0	<1	0	15
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	4°	Sw	1	0

Species recorded in monitoring plot 77. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	15	-	-
<i>Juncus effusus</i>	Common Rush	14	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	1	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex nigra</i>	Common Sedge	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cirsium palustre</i>	Marsh Thistle	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Dryopteris dilatata</i>	Broad Buckler-fern	-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Epilobium palustre</i>	Marsh Willowherb	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus conglomeratus</i>	Compact Rush	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Scleropodium purum</i>	Neat Feather-moss	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+

The construction work of the new road to the establishment of a telecommunication mast has destroyed Monitoring plot 32, 34, and 62, and therefore they were not analyzed. 28-08-2019.

Appendix 4

Site no. 3, monitoring plots 100-104 and site no. 4, monitoring plots 105-114



Monitoring plot 100. The pinpoint frame is located in the center of the picture in the dense vegetation cover to the right of the assistant, photo direction north. Photo no. 5636, 26-08-2019.

Vegetation and ecological parameters in monitoring plot 100.

Height of vegetation in cm	12	14	10	14
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	< 1	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	< 1	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	10°	S	< 1	< 1

Species recorded in monitoring plot 100. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Carex arenaria</i>	Sand Sedge	15	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	11	-	-
<i>Empetrum nigrum</i>	Crowberry	3	-	-
<i>Scleropodium purum</i>	Neat Feather-moss	1	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	-	+	-
<i>Rumex acetosella</i>	Sheep's Sorrel	-	+	-
	Seedling	-	+	-
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Cerastium fontanum subsp. vulgare var. vulgare</i>	Common Mouse-ear	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Dryopteris dilatata</i>	Broad Buckler-fern	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Geranium robertianum</i>	Herb Robert	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Luzula campestris</i>	Field Wood-rush	-	-	+
<i>Polypodium vulgare</i>	Polypodium	-	-	+
<i>Rumex acetosa</i>	Common Sorrel	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+



Monitoring plot 101. The pinpoint frame is located in the center of the picture in the open vegetation cover, photo direction north. Photo no. 5635, 26-08-2019.

Vegetation and ecological parameters in monitoring plot 101.

Height of vegetation in cm	15	10	4	4
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	2	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	1	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	8°	SW	5	< 1

Species recorded in monitoring plot 101. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Empetrum nigrum</i>	Crowberry	9	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	6	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	5	-	-
<i>Carex arenaria</i>	Sand Sedge	2	-	-
	Litter	2	-	-
<i>Rumex acetosella</i>	Sheep's Sorrel	-	+	-
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+



Monitoring plot 102. The pinpoint frame is located in the center of the picture in the semi-dense vegetation cover to the right of the assistant, photo direction north. Photo no. 5634, 26-08-2019.

Vegetation and ecological parameters in monitoring plot 102.

	20	21	18	20
Height of vegetation in cm	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	1	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	0	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	6°	W	1	< 1

Species recorded in monitoring plot 102. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Carex arenaria</i>	Sand Sedge	15	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	8	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	6	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	1	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Cerastium fontanum subsp. vulgare</i> <i>var. vulgare</i>	Common Mouse-ear	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia macilenta subsp. floerke-</i> <i>ana</i>		-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Dryopteris dilatata</i>	Broad Buckler-fern	-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



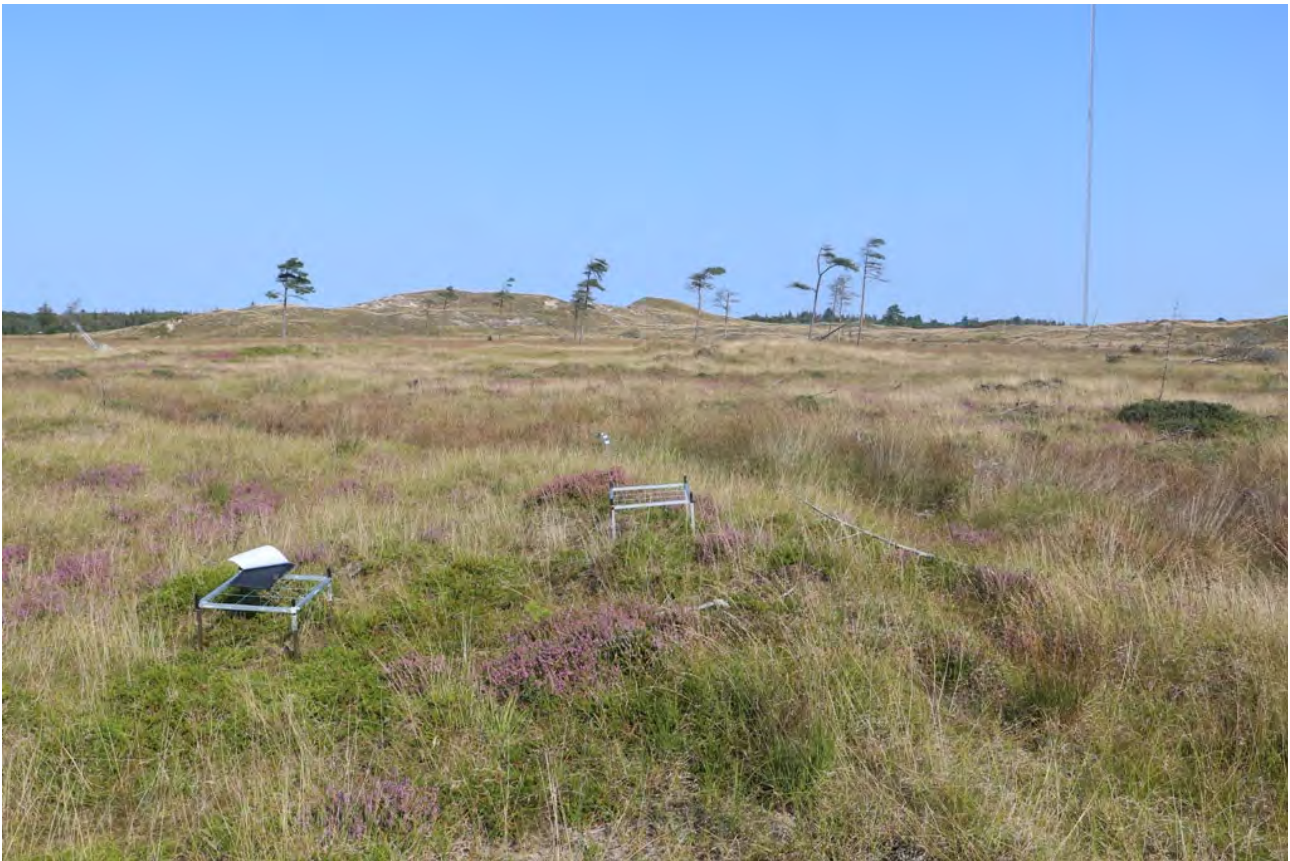
Monitoring plot 103. The pinpoint frame is located in the center of the picture in the semi-dense vegetation cover to the right of the assistant, photo direction north. Photo no. 5628, 26-08-2019.

Vegetation and ecological parameters in monitoring plot 103.

	13	12	10	11
Height of vegetation in cm	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	3	< 1	0	5
	Bare soil	Bare sand	Dead wood	
Cover in m ²	<1	0	0	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	10°	S	< 1	0

Species recorded in monitoring plot 103. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Calluna vulgaris</i>	Heather	14	-	-
<i>Carex arenaria</i>	Sand Sedge	14	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	11	-	-
<i>Galium saxatile</i>	Heath Bedstraw	2	-	-
<i>Erica tetralix</i>	Cross-leaved Heath	1	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Betula pubescens</i>	Downy Birch	-	-	+
<i>Carex nigra</i>	Common Sedge	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Phragmites australis</i>	Reed	-	-	+
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+
<i>Salix cinerea</i>	Grey Willow	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 104. The pinpoint frame is located in the center of the picture in the open vegetation cover while the one to the left is misplaced, photo direction north. Photo no. 5627, 26-08-2019.

Vegetation and ecological parameters in monitoring plot 104.

	4	10	4	4
Height of vegetation in cm	4	10	4	4
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	30	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	1	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	4°	SV	5	< 1

Species recorded in monitoring plot 104. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	12	-	-
<i>Carex arenaria</i>	Sand Sedge	6	-	-
<i>Empetrum nigrum</i>	Crowberry	5	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	1	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus articulatus</i>	Jointed Rush	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Juncus filiformis</i>	Thread Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Phragmites australis</i>	Reed	-	-	+
<i>Pinus sylvestris</i>	Scots Pine	-	-	+
<i>Polytrichum juniperinum</i>	Juniper Haircap	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 105. The pinpoint frame is located in the center of the picture at the end of the white string almost hidden in the dense vegetation cover, photo direction north. Photo no. 5631, 26-08-2019.

Vegetation and ecological parameters in monitoring plot 105.

Height of vegetation in cm	25	25	20	13
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	10	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	3°	SE	10	< 1

Species recorded in monitoring plot 105. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	14	-	-
<i>Carex arenaria</i>	Sand Sedge	13	-	-
<i>Scleropodium purum</i>	Neat Feather-moss	10	-	-
<i>Calluna vulgaris</i>	Heather	6	-	-
<i>Galium saxatile</i>	Heath Bedstraw	5	-	-
<i>Empetrum nigrum</i>	Crowberry	1	-	-
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Lysimachia europaea</i>	Chickweed-wintergreen	-	-	+
<i>Phragmites australis</i>	Reed	-	-	+
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Salix repens subsp. repens var. argentea</i>		-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+



Monitoring plot 106. The pinpoint frame is located in the center of the picture in the open vegetation cover behind the assistant, photo direction north. Photo no. 5632, 26-08-2019.

Vegetation and ecological parameters in monitoring plot 106.

	5	10	5	7
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	20	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	5	0	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	8°	SW	5	< 1

Species recorded in monitoring plot 106. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	8	-	-
<i>Carex arenaria</i>	Sand Sedge	6	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	5	-	-
<i>Carex nigra</i>	Common Sedge	3	-	-
<i>Dicranum scoparium</i>	Broom Moss	1	-	-
<i>Cladonia sp. s.s.</i>		-	+	-
<i>Galium saxatile</i>	Heath Bedstraw	-	+	-
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Cladonia macilenta subsp. floerkeana</i>		-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Lysimachia europaea</i>	Chickweed-wintergreen	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Salix repens subsp. repens var. repens</i>	Creeping Willow	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 107. The pinpoint frame is located in the center of the picture in the open vegetation cover, photo direction north. Photo no. 5633, 26-08-2019.

Vegetation and ecological parameters in monitoring plot 107. .

	10	10	8	5
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	50	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	<1	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0	-	10	< 1

Species recorded in monitoring plot 107. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	16	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	15	-	-
<i>Carex arenaria</i>	Sand Sedge	2	-	-
<i>Calluna vulgaris</i>	Heather	1	-	-
<i>Cladonia macilenta subsp. floerkeana</i>		-	+	-
<i>Empetrum nigrum</i>	Crowberry	-	+	-
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Lysimachia europaea</i>	Chickweed-wintergreen	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Quercus robur</i>	Pedunculate Oak	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Salix repens subsp. repens var. repens</i>	Creeping Willow	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 108. The pinpoint frame is located in the center of the picture in the semi-dense vegetation cover to the right of the log, photo direction north. Photo no. 5630, 26-08-2019.

Vegetation and ecological parameters in monitoring plot 108.

	20	19	20	18
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	70	<1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	5	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0°	-	25	<1

Species recorded in monitoring plot 108. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Vaccinium uliginosum</i>	Bog Bilberry	16	-	-
<i>Dicranum scoparium</i>	Broom Moss	1	-	-
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	1	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	-	+	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	-	-	+
<i>Calamagrostis</i> cfr.		-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex nigra</i>	Common Sedge	-	-	+
<i>Cladonia macilenta</i> subsp. <i>floerkeana</i>		-	-	+
<i>Cladonia</i> sp. s.l.		-	-	+
<i>Cladonia</i> sp.		-	-	+
<i>Dryopteris dilatata</i>	Broad Buckler-fern	-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Luzula multiflora</i>	Heath Wood-rush	-	-	+
<i>Lysimachia europaea</i>	Chickweed-wintergreen	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Myrica gale</i>	Bog-myrtle	-	-	+
<i>Phragmites australis</i>	Reed	-	-	+
<i>Pinus sylvestris</i>	Scots Pine	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+
<i>Salix repens</i> subsp. <i>repens</i> var. <i>repens</i>	Creeping Willow	-	-	+
<i>Sorbus aucuparia</i>	Rowan	-	-	+



Monitoring plot 109. The pinpoint frame is located in the center of the picture in the open vegetation cover in front of the assistant, photo direction north. Photo no. 5629, 26-08-2019.

Vegetation and ecological parameters in monitoring plot 109.

	14	21	11	11
Height of vegetation in cm	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	75	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	8°	SW	5	<1

Species recorded in monitoring plot 109. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Vaccinium uliginosum</i>	Bog Bilberry	12	-	-
<i>Calluna vulgaris</i>	Heather	9	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	6	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	1	-	-
<i>Carex arenaria</i>	Sand Sedge	-	+	-
<i>Erica tetralix</i>	Cross-leaved Heath	-	+	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	-	-	+
<i>Betula pubescens</i>	Downy Birch	-	-	+
<i>Carex nigra</i>	Common Sedge	-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Juncus conglomeratus</i>	Compact Rush	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+



Monitoring plot 110. The pinpoint frame is located in the center of the picture at the end of the track to the right of the assistant almost hidden in the dense vegetation cover, photo direction north. Photo no. 5642, 27-08-2019.

Vegetation and ecological parameters in monitoring plot 110.

Height of vegetation in cm	22	17	25	24
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	50	0	0	50
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	2	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	8°	SW	1	<1

Species recorded in monitoring plot 110. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	12	-	-
<i>Myrica gale</i>	Bog-myrtle	12	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	7	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	4	-	-
<i>Vaccinium uliginosum</i>	Bog Bilberry	4	-	-
<i>Bryopsida</i>	Mosses	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Dryopteris dilatata</i>	Broad Buckler-fern	-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Phragmites australis</i>	Reed	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Solanum dulcamara</i>	Bittersweet	-	-	+



Monitoring plot 111. The pinpoint frame is located in the center of the picture at the end of the white string almost hidden in the dense vegetation cover, photo direction north. Photo no. 5643, 27-08-2019.

Vegetation and ecological parameters in monitoring plot 111.

	40	10	20	10
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	60	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	5°	SW	3	0

Species recorded in monitoring plot 111. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	12	-	-
<i>Scleropodium purum</i>	Neat Feather-moss	10	-	-
<i>Calluna vulgaris</i>	Heather	8	-	-
<i>Vaccinium uliginosum</i>	Bog Bilberry	7	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	3	-	-
<i>Erica tetralix</i>	Cross-leaved Heath	2	-	-
<i>Carex arenaria</i>	Sand Sedge	1	-	-
<i>Phragmites australis</i>	Reed	1	-	+
<i>Avenella flexuosa</i>	Wavy Hair-grass	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Juncus conglomeratus</i>	Compact Rush	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Lysimachia europaea</i>	Chickweed-wintergreen	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Rumex acetosa</i>	Common Sorrel	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+



Monitoring plot 112. The pinpoint frame is located left of the center of the picture in the open vegetation cover to the right of the assistant, photo direction north. Photo no. 5644, 27-08-2019.

Vegetation and ecological parameters in monitoring plot 112.

	19	17	18	15
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	15	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	1	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²

Species recorded in monitoring plot 112. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	15	-	-
<i>Carex arenaria</i>	Sand Sedge	11	-	-
<i>Galium saxatile</i>	Heath Bedstraw	5	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	5	-	-
<i>Scleropodium purum</i>	Neat Feather-moss	5	-	-
<i>Dicranum scoparium</i>	Broom Moss	1	-	-
<i>Bryopsida</i>	Mosses	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Cladonia macilenta subsp. floerkeana</i>		-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Lysimachia europaea</i>	Chickweed-wintergreen	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 113. The pinpoint frame is located in the center of the picture in the open vegetation cover, photo direction north. Photo no. 5645, 27-08-2019.

Vegetation and ecological parameters in monitoring plot 113.

	5	0	9	9
Height of vegetation in cm	5	0	9	9
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	60	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	< 1	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	10°	NE	60	< 1

Species recorded in monitoring plot 113. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Calluna vulgaris</i>	Heather	10	-	-
<i>Bryophyte</i>	Mosses	7	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	3	-	-
<i>Vaccinium uliginosum</i>	Bog Bilberry	2	-	-
<i>Salix repens subsp. repens var. repens</i>	Creeping Willow	1	-	-
	Sand	1	-	-
<i>Carex arenaria</i>	Sand Sedge	-	+	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	-	+	-
<i>Betula pubescens</i>	Downy Birch	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Cladonia sp. s.s.</i>		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Lysimachia europaea</i>	Chickweed-wintergreen	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Pinus sylvestris</i>	Scots Pine	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Sorbus aucuparia</i>	Rowan	-	-	+



Monitoring plot 114. The pinpoint frame is located in the center of the picture in the open vegetation cover in front of the assistant, photo direction north. Photo no. 5646, 27-08-2019.

Vegetation and ecological parameters in monitoring plot 114

	8	7	10	14
Height of vegetation in cm	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	50	<1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	<1	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	6°	NE	25	< 1

Species recorded in monitoring plot 114. In the table a species is recorded the first time it is has been recorded in the field, only

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Calluna vulgaris</i>	Heather	12	-	-
<i>Carex arenaria</i>	Sand Sedge	9	-	-
<i>Vaccinium uliginosum</i>	Bog Bilberry	6	-	-
<i>Dicranum scoparium</i>	Broom Moss	4	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	3	-	-
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	2	-	-
<i>Cladonia sp. s.s.</i>		-	+	-
<i>Ammophila arenaria</i>	Marram	-	-	+
<i>Betula pubescens</i>	Downy Birch	-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus conglomeratus</i>	Compact Rush	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Phragmites australis</i>	Reed	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+
<i>Salix repens subsp. repens var. argentea</i>		-	-	+

Appendix 5

Site no. 5, monitoring plot 115-129



Monitoring plot 115. The pinpoint frame is located in the center of the picture in the semi-dense vegetation cover at the end of the white string beginning at the red handle, photo direction north. Photo no. 5691, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 115.

Height of vegetation in cm	20	7	7	7
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	8	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	4°	NW	< 1	<1

Species recorded in monitoring plot 115. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Agrostis capillaris</i>	Common Bent	-	+	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	15	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	3	-	-
<i>Galium saxatile</i>	Heath Bedstraw	2	-	-
<i>Carex arenaria</i>	Sand Sedge	1	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	1	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	1	-	-
<i>Scleropodium purum</i>	Neat Feather-moss	1	-	-
<i>Sorbus aucuparia</i>	Rowan	1	-	-
<i>Calluna vulgaris</i>	Heather	-	+	-
<i>Amalanchier spicata</i>	Dwarf Serviceberry	-	-	+
<i>Bryopsida</i>	Mosses	-	-	+
<i>Cladonia chlorophaea</i> agg.		-	-	+
<i>Calamagrostis epigeios</i>	Wood Small-reed	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Scorzonerooides autumnalis</i>	Autumn Hawkbit	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Viola tricolor</i>	Wild Pansy	-	-	+



Monitoring plot 116. The pinpoint frame is located in the center of the picture in the open vegetation cover to the right of the assistant, photo direction north. Photo no. 5693, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 116,

	9	6	11	9
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	12	1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	<1	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	8°	NE	< 1	<1

Species recorded in monitoring plot 116. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	15	-	-
<i>Calluna vulgaris</i>	Heather	8	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	6	-	-
<i>Polytrichum commune</i>	Common Haircap	1	-	-
<i>Scleropodium purum</i>	Neat Feather-moss	1	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Cladonia chlorophaea agg.</i>		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Dryopteris dilatata</i>	Broad Buckler-fern	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Luzula multiflora</i>	Heath Wood-rush	-	-	+
<i>Polypodium vulgare</i>	Polypodium	-	-	+
<i>Rubus idaeus</i>	Raspberry	-	-	+
<i>Rumex acetosa</i>	Common Sorrel	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Salix repens subsp. repens var. repens</i>	Creeping Willow	-	-	+
<i>Sorbus aucuparia</i>	Rowan	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 117. The pinpoint frame is located in the center of the picture nearly open vegetation cover, photo direction north. Photo no. 5692, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 117.

	10	20	20	10
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	33	<1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	< 1	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	14°	NW	< 1	< 1

Species recorded in monitoring plot 117. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	16	-	-
<i>Calluna vulgaris</i>	Heather	7	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	3	-	-
<i>Galium saxatile</i>	Heath Bedstraw	2	-	-
<i>Carex arenaria</i>	Sand Sedge	1	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Cerastium fontanum</i> subsp. <i>vulgare</i> var. <i>vulgare</i>	Common Mouse-ear	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia chlorophaea</i> agg.		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Polypodium vulgare</i>	Polypodium	-	-	+
<i>Rubus idaeus</i>	Raspberry	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Scleropodium purum</i>	Neat Feather-moss	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Vaccinium vitis-idea</i>	Cowberry	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 118. The pinpoint frame is located in the center of the picture in the semi-dense vegetation cover to the left of the assistant, photo direction north. Photo no. 5690, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 118.

Height of vegetation in cm		15	7	6	8
	Dwarf shrub		Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	4	< 1	0	0	
	Bare soil		Bare sand	Dead wood	
Cover in m ²	0	0	< 1		
Light penetration	96	96	96	96	96
	Inclination		Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	8°	S	1	<1	

Species recorded in monitoring plot 118. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Avenella flexuosa</i>	Wavy Hair-grass	15	-	-
<i>Calluna vulgaris</i>	Heather	2	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	2	-	-
<i>Campylopus introflexus</i>	Heath Star-moss	1	-	-
<i>Carex arenaria</i>	Sand Sedge	1	-	-
	Litter	1	-	-
<i>Cladonia chlorophaea</i> agg.		-	+	-
<i>Dicranum scoparium</i>	Broom Moss	-	+	-
<i>Rumex acetosella</i>	Sheep's Sorrel	-	+	+
<i>Scleropodium purum</i>	Neat Feather-moss	-	+	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Calamagrostis epigeios</i>	Wood Small-reed	-	-	+
<i>Carex nigra</i>	Common Sedge	-	-	+
<i>Cladonia</i> sp.		-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Galeopsis bifida</i>	Bifid Hemp-nettle	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Quercus robur</i>	Pedunculate Oak	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Sorbus aucuparia</i>	Rowan	-	-	+



Monitoring plot 119. The pinpoint frame is located in the center of the picture in the open vegetation cover to the right of the assistant, photo direction north. Photo no. 5694, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 119.

Height of vegetation in cm	14	20	20	15
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	5	1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	<1	0	<1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	4°	W	< 1	< 1

Species recorded in monitoring plot 119. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	16	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	5	-	-
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	2	-	-
<i>Rubus idaeus</i>	Raspberry	2	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	1	-	-
<i>Cladonia chlorophaea agg.</i>		-	+	-
<i>Bryopsida</i>	Mosses	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia portentosa</i>		-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+



Monitoring plot 120. The pinpoint frame is located in the center of the picture the grazed vegetation cover. Photo no. 5702, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 120.

Height of vegetation in cm2		4	2	3
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	33	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	<1	0	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	12°	E	< 1	<1

Species recorded in monitoring plot 120. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	11	-	-
<i>Campylopus introflexus</i>	Heath Star-moss	2	-	-
	Naked soil	2	-	-
<i>Agrostis capillaris</i>	Common Bent	1	-	-
<i>Erica tetralix</i>	Cross-leaved Heath	1	-	-
<i>Marcantiopsida</i>	Liverwort	1	-	-
<i>Agrostis stolonifera</i>	Creeping Bent	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex echinata</i>	Star Sedge	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Juncus filiformis</i>	Thread Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Polygonum aviculare</i>	Knotgrass	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+



Monitoring plot 121. The pinpoint frame is located in the center of the picture the open, grazed vegetation cover to the left of the assistant, photo direction north. Photo no. 5701, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 121.

Height of vegetation in cm	3	2	2	1
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	< 1	< 1	0	<1
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	< 1	<1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	2°	N	< 1	0

Species recorded in monitoring plot 121. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	7	-	-
<i>Calluna vulgaris</i>	Heather	7	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	5	-	-
<i>Polytrichum commune</i>	Common Haircap	2	-	-
<i>Campylopus introflexus</i>	Heath Star-moss	1	-	-
<i>Carex pilulifera</i>	Pill Sedge	1	-	-
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	1	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Carex echinata</i>	Star Sedge	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Eriophorum angustifolium</i>	Common Cottongrass	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Juncus filiformis</i>	Thread Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Persicaria lapathifolia subsp. pallida</i>	Pale Persicaria	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Stellaria media</i>	Common Chickweed	-	-	+
<i>Trifolium repens</i>	White Clover	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 122. The pinpoint frame is located in the center of the picture the the semi-dense, grazed vegetation cover to the left of the assistant, photo direction north. Photo no. 5695, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 122.

	7	1	16	6
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	< 1	0	0	1
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	<1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	4°	E	< 1	0

Species recorded in monitoring plot 122. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	13	-	-
<i>Polytrichum commune</i>	Common Haircap	4	-	-
<i>Juncus effusus</i>	Common Rush	3	-	-
<i>Agrostis capillaris</i>	Common Bent	2	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	1	-	-
<i>Juncus squarrosus</i>	Heath Rush	1	-	-
	Water	1	-	-
<i>Bryopsida</i>	Mosses	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex echinata</i>	Star Sedge	-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+



Monitoring plot 123. The pinpoint frame is located in the center of the picture the open, grazed vegetation cover, photo direction north. Photo no. 5703, 30-08-2019.

Vegetation and ecological parameters in monitoring plot 123.

Height of vegetation in cm	2	2	3	1
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	< 1	< 1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	<1	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	2°	E	< 1	<1

Species recorded in monitoring plot 123. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	8	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	8	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	5	-	-
<i>Campylopus introflexus</i>	Heath Star-moss	1	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	1	-	-
<i>Cerastium fontanum subsp. vulgare</i> var. <i>vulgare</i>	Common Mouse-ear	-	+	-
<i>Achillea millefolium</i>	Yarrow	-	-	+
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Bidens tripartita</i>	Trifid Bur-marigold	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex arenaria</i>	Sand Sedge	-	-	+
<i>Carex pilulifera</i>	Pill Sedge	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia chlorophaea agg.</i>		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Eriophorum angustifolium</i>	Common Cottongrass	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	-	-	+
<i>Polytrichum commune</i>	Common Haircap	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Quercus robur</i>	Pedunculate Oak	-	-	+
<i>Rubus sect. Rubus</i>	Bramble	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Scleropodium purum</i>	Neat Feather-moss	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Trifolium repens</i>	White Clover	-	-	+



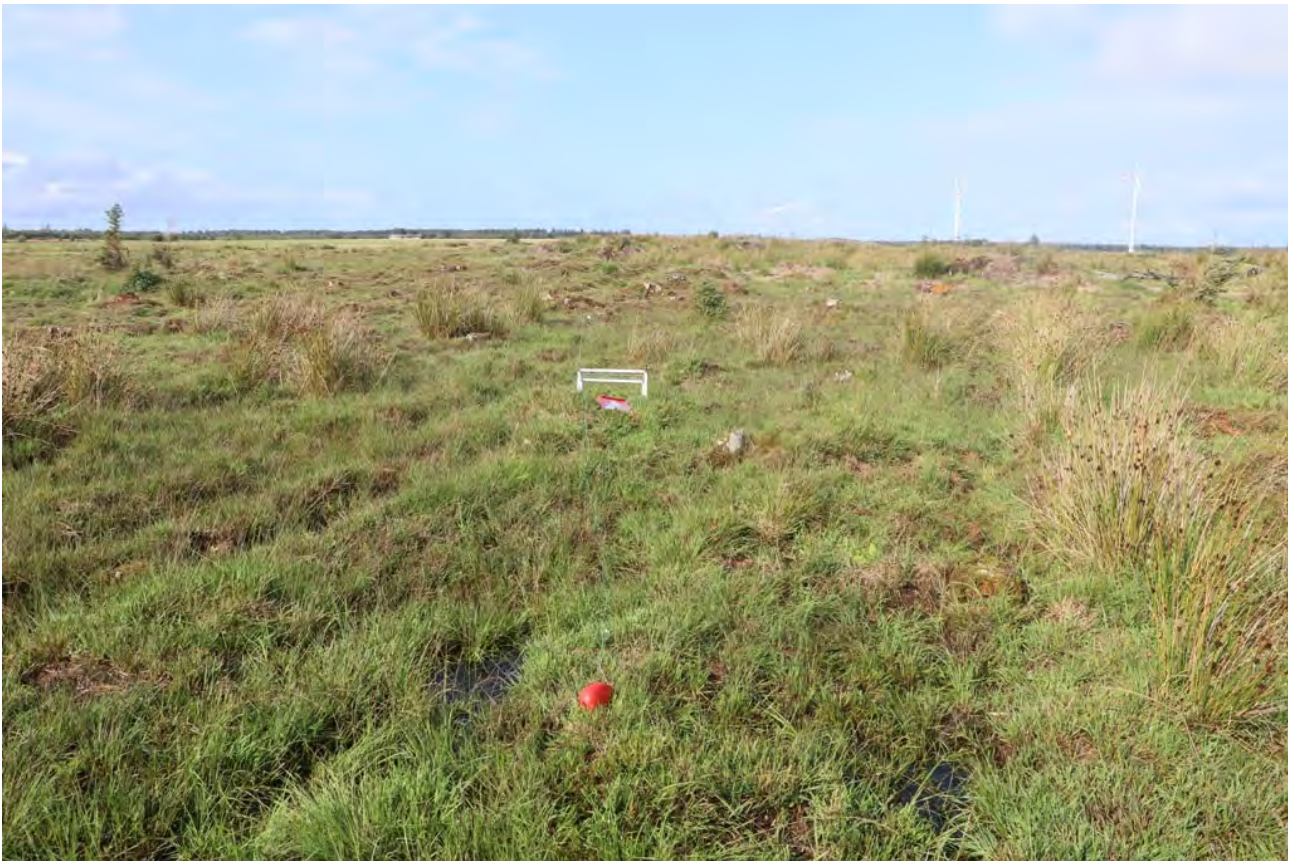
Monitoring plot 124. The pinpoint frame is located in the center of the picture the semi-dense, grazed vegetation cover, photo direction north. Photo no. 5706, 30-08-2019.

Vegetation and ecological parameters in monitoring plot 124.

	10	25	10	5
Height of vegetation in cm	10	25	10	5
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	< 1	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	<1	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	0°	-	1	0

Species recorded in monitoring plot 124. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Holcus lanatus</i>	Yorkshire-fog	10	-	-
<i>Juncus effuses</i>	Common Rush	6	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	3	-	-
	Litter	3	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Avenella flexuosa</i>	Wavy Hair-grass	-	-	+
<i>Bryopsida</i>	Mosses	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Carex canescens</i>	Grey Sedge	-	-	+
<i>Carex pilulifera</i>	Pill Sedge	-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Ranunculus repens</i>	Creeping Buttercup	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Trifolium repens</i>	White Clover	-	-	+



Monitoring plot 125. The pinpoint frame is located in the center of the picture in the open, grazed vegetation cover, photo direction north. Photo no. 5696 29-08-2019.

Vegetation and ecological parameters in monitoring plot 125.

	14	16	5	5
Height of vegetation in cm	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	2	< 1	0	30
	Bare soil	Bare sand	Dead wood	
Cover in m ²	1	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	20°	N	< 1	< 1

Species recorded in monitoring plot 125. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	13	-	-
<i>Erica tetralix</i>	Cross-leaved Heath	7	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	2	-	-
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	1	-	-
	Mud	1	-	-
<i>Betula pubescens</i>	Downy Birch	-	-	+
<i>Bryopsida</i>	Mosses	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Carex arenaria</i>	Sand Sedge	-	-	+
<i>Carex panacea</i>	Carnation Sedge	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia sp.</i>		-	-	+
<i>Cladonia chlorophaea agg.</i>		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Juncus filiformis</i>	Thread Rush	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Polytrichum commune</i>	Common Haircap	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Salix repens subsp. repens var. repens</i>	Creeping Willow	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Trifolium repens</i>	White Clover	-	-	+



Monitoring plot 126. The pinpoint frame is located in the center of the picture in the open, grazed vegetation cover to the left of the assistant, photo direction north. Photo no. 5697, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 126.

	2	2	2	2
Height of vegetation in cm	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	1	< 1	0	<1
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	<1	2	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	10°	E	< 1	< 1

Species recorded in monitoring plot 126. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	12	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	5	-	-
<i>Galium saxatile</i>	Heath Bedstraw	2	-	-
<i>Calluna vulgaris</i>	Heather	1	-	-
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	1	-	-
<i>Potentilla erecta</i>	Tormentil	1	-	-
<i>Carex pilulifera</i>	Pill Sedge	-	+	-
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Cerastium fontanum</i> subsp. <i>vulgare</i> var. <i>vulgare</i>	Common Mouse-ear	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia portentosa</i>		-	-	+
<i>Cladonia</i> sp.		-	-	+
<i>Cladonia chlorophaea</i> agg.		-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Eriophorum angustifolium</i>	Common Cottongrass	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Polytrichum commune</i>	Common Haircap	-	-	+
<i>Rubus</i> sect. <i>Rubus</i>	Bramble	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 127. The pinpoint frame is located in the center of the picture in the open, grazed vegetation cover, photo direction north. Photo no. 5700, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 127.

	5	5	4	10
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	< 1	< 1	<1	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	1	0	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	2°	S	< 1	<1

Species recorded in monitoring plot 127. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Holcus lanatus</i>	Yorkshire-fog	9	-	-
<i>Eriophorum angustifolium</i>	Common Cottongrass	4	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	3	-	-
	Litter	3	-	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Bryopsida</i>	Mosses	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Carex pilulifera</i>	Pill Sedge	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia chlorophaea</i> agg.		-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Empetrum nigrum</i>	Crowberry	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	-	-	+
<i>Juncus effusus</i>	Common Rush	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Picea sitchensis</i>	Sitka Spruce	-	-	+
<i>Polytrichum juniperinum</i>	Juniper Haircap	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Quercus robur</i>	Pedunculate Oak	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+



Monitoring plot 128. The pinpoint frame is located in the center of the picture in the open, grazed vegetation cover to the right of the assistant, photo direction north. Photo no. 5699, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 128.

	8	5	5	4
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	< 1	5	0	<1
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	10°	NW	2	< 1

Species recorded in monitoring plot 128. In the table a species is recorded the first time it has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	13	-	-
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	4	-	-
<i>Rubus sect. Rubus</i>	Bramble	3	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	2	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	1	-	-
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex pilulifera</i>	Pill Sedge	-	-	+
<i>Cerastium fontanum subsp. vulgare</i> var. <i>vulgare</i>	Common Mouse-ear	-	-	+
<i>Cladonia chlorophaea</i> agg.		-	-	+
<i>Cladonia portentosa</i>		-	-	+
<i>Cladonia</i> sp.		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Eriophorum angustifolium</i>	Common Cottongrass	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Juncus squarrosus</i>	Heath Rush	-	-	+
<i>Quercus robur</i>	Pedunculate Oak	-	-	+
<i>Scleropodium purum</i>	Neat Feather-moss	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Trifolium repens</i>	White Clover	-	-	+



Monitoring plot 129. The pinpoint frame is located in the center of the picture in the open grazed vegetation cover, photo direction north. Photo no. 5698, 29-08-2019.

Vegetation and ecological parameters in monitoring plot 129.

	3	5	5	5
Height of vegetation in cm	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	1	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	<1	1	1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	4°	SW	< 1	< 1

Species recorded in monitoring plot 129. In the table a species is recorded the first time it has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Avenella flexuosa</i>	Wavy Hair-grass	13	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	3	-	-
	Dung	2	-	-
<i>Scleropodium purum</i>	Neat Feather-moss	1	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	-	+	-
<i>Agrostis capillaris</i>	Common Bent	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Cerastium fontanum</i> subsp. <i>vulgare</i> var. <i>vulgare</i>	Common Mouse-ear	-	-	+
<i>Cladonia chlorophaea</i> agg.		-	-	+
<i>Cladonia</i> sp.		-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	-	-	+
<i>Polygonum aviculare</i>	Knotgrass	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Vaccinium uliginosum</i>	Bog Bilberry	-	-	+

Appendix 6

Site no. 7, monitoring plot 130-134



Monitoring plot (130) 209. The pinpoint frame is located in the center of the picture almost hidden in the dense vegetation cover at the red write board, photo direction north. Photo no. 566, 28-08-2019.

Vegetation and ecological parameters in monitoring plot (130) 209.

Height of vegetation in cm	15	30	15	20
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	5	<1	0	5
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	6°	NE	10	0
Remark	The monitoring plot has been moved 8 m W to avoid to include a part of the gravel road and re-named monitoring plot 209			

Species recorded in monitoring plot (130) 209. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	16	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	7	-	-
<i>Juncus effuses</i>	Common Rush	3	-	-
<i>Scleropodium purum</i>	Neat Feather-moss	2	-	-
<i>Agrostis capillaris</i>	Common Bent	1	-	-
<i>Argentina anserina</i>	Silverweed	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Carex echinata</i>	Star Sedge	-	-	+
<i>Cerastium fontanum subsp. vulgare</i> <i>var. vulgare</i>	Common Mouse-ear	-	-	+
<i>Cirsium arvense</i>	Creeping Thistle	-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Epilobium sp.</i>		-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Medicago lupulina</i>	Black Medick	-	-	+
<i>Plantago major</i>	Greater Plantain	-	-	+
<i>Pleurozium schreberi</i>	Red-stemmed Feather-moss	-	-	+
<i>Polytrichum commune</i>	Common Haircap	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Ranunculus repens</i>	Creeping Buttercup	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Rumex crispus</i>	Curled Duck	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+
<i>Salix repens subsp. repens var. repens</i>	Creeping Willow	-	-	+
<i>Scorzonerooides autumnalis</i>	Autumn Hawkbit	-	-	+
<i>Sonchus asper</i>	Prickly Sowthistle	-	-	+
<i>Trifolium pratense</i>	Red Clover	-	-	+



Monitoring plot (131) 208. The pinpoint frame is located in the center of the picture almost hidden in the dense vegetation cover at the end of the white string, photo direction north. Photo no. 5667, 28-08-2019.

Vegetation and ecological parameters in monitoring plot (131) 208.

	Height of vegetation in cm5	25	10	10
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	1	0	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	<1	0	0	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	5°	SW	1	0
Remark	The monitoring plot has been moved 5 m W to avoid to include a part of the gravel road and re-named monitoring plot 208			

Species recorded in monitoring plot (131) 208. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Agrostis capillaris</i>	Common Bent	13	-	-
<i>Argentina anserina</i>	Silverweed	4	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	1	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	1	-	-
<i>Potentilla erecta</i>	Tormentil	1	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Carex echinata</i>	Star Sedge	-	-	+
<i>Carex nigra</i>	Common Sedge	-	-	+
<i>Cerastium fontanum</i> subsp. <i>vulgare</i> var. <i>vulgare</i>	Common Mouse-ear	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cirsium arvense</i>	Creeping Thistle	-	-	+
<i>Cirsium vulgare</i>	Spear Thistle	-	-	+
<i>Epilobium adenocaulon</i>	American Willowherb	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Eriophorum angustifolium</i>	Common Cottongrass	-	-	+
<i>Holcus mollis</i>	Creeping Soft-grass	-	-	+
<i>Juncus conglomeratus</i>	Compact Rush	-	-	+
<i>Medicago lupulina</i>	Black Medick	-	-	+
<i>Molinia caerulea</i>	Purple Moor-grass	-	-	+
<i>Plantago lanceolata</i>	Ribwort Plantain	-	-	+
<i>Plantago major</i>	Greater Plantain	-	-	+
<i>Poa pratensis</i>	Smooth Meadow Grass	-	-	+
<i>Polytrichum juniperinum</i>	Juniper Haircap	-	-	+
<i>Ranunculus repens</i>	Creeping Buttercup	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+
<i>Salix repens</i> subsp. <i>repens</i> var. <i>repens</i>	Creeping Willow	-	-	+
<i>Scorzoneroides autumnalis</i>	Autumn Hawkbit	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Trifolium pratense</i>	Red Clover	-	-	+
<i>Vicia cracca</i>	Tufted Vetch	-	-	+



Monitoring plot (132) 207. The pinpoint frame is located in the center of the picture almost hidden in the dense vegetation cover, photo direction north. Photo no. 5668, 28-08-2019.

Vegetation and ecological parameters in monitoring plot (132) 207.

	30	18	30	13
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	< 1	1	0	5
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	< 1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	10°	E	10	<1
Remark	The monitoring plot has been moved 5 m SW to avoid to include a part of the gravel road and re-named monitoring plot 207			

Species recorded in monitoring plot (132) 207. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	15	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	9	-	-
<i>Argentina anserina</i>	Silverweed	2	-	-
<i>Juncus effusus</i>	Common Rush	2	-	-
<i>Agrostis capillaris</i>	Common Bent	-	+	-
<i>Viola palustris</i>	Marsh Violet	-	+	-
<i>Ranunculus repens</i>	Creeping Buttercup	-	+	-
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Cerastium fontanum subsp. vulgare var. vulgare</i>	Common Mouse-ear	-	-	+
<i>Cirsium arvense</i>	Creeping Thistle	-	-	+
<i>Cirsium palustre</i>	Marsh Thistle	-	-	+
<i>Cladonia chlorophaea agg.</i>		-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Prunella vulgaris</i>	Selfheal	-	-	+
<i>Polytrichastrum formosum</i>	Bank Haircap	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Salix cinerea</i>	Grey Willow	-	-	+
<i>Salix repens subsp. repens var. repens</i>	Creeping Willow	-	-	+
<i>Scleropodium purum</i>	Neat Feather-moss	-	-	+
<i>Scorzoneroides autumnalis</i>	Autumn Hawkbit	-	-	+



Monitoring plot (133) 206. The pinpoint frame is located in the center of the picture at the end of the white string almost hidden in the dense vegetation cover, photo direction north. Photo no. 5669, 28-08-2019.

Vegetation and ecological parameters in monitoring plot (133) 206.

Height of vegetation in cm	50	40	15	1
	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	1	0	0	1
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	0	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	5°	W	< 1	0
Remark	The monitoring plot has been moved 5 m W to avoid to include a part of the gravel road and re-named monitoring plot 206			

Species recorded in monitoring plot (133) 206. In the table a species is recorded the first time it is has been recorded in the field, only.

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Molinia caerulea</i>	Purple Moor-grass	13	-	-
<i>Juncus conglomeratus</i>	Compact Rush	4	-	-
<i>Agrostis capillaris</i>	Common Bent	1	-	-
<i>Bryopsida</i>	Mosses	1	-	-
<i>Cirsium arvense</i>	Creeping Thistle	1	-	-
<i>Potentilla erecta</i>	Tormentil	1	-	-
<i>Prunella vulgaris</i>	Selfheal	1	-	-
<i>Agrostis capillaris</i>	Common Bent	-	+	-
<i>Elytrigia repens</i>	Common Couch	-	+	-
<i>Achillea ptarmica</i>	Sneezewort	-	-	+
<i>Argentina anserina</i>	Silverweed	-	-	+
<i>Artemisia vulgaris</i>	Mugwort	-	-	+
<i>Calamagrostis epigeios</i>	Wood Small-reed	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Campylopus introflexus</i>	Heath Star-moss	-	-	+
<i>Cerastium fontanum subsp. vulgare</i> var. <i>vulgare</i>	Common Mouse-ear	-	-	+
<i>Cirsium palustre</i>	Marsh Thistle	-	-	+
<i>Epilobium adenocaulon</i>	American Willowherb	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Holcus lanatus</i>	Yorkshire-fog	-	-	+
<i>Holcus mollis</i>	Creeping Soft-grass	-	-	+
<i>Hypochaeris radicata</i>	Cat's-ear	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Lolium perenne</i>	Perennial Ryegrass	-	-	+
<i>Medicago lupulina</i>	Black Medick	-	-	+
<i>Mentha x verticillata</i>	Whorled Mint	-	-	+
<i>Plantago major</i>	Greater Plantain	-	-	+
<i>Ranunculus repens</i>	Creeping Buttercup	-	-	+
<i>Rumex acetosella</i>	Sheep's Sorrel	-	-	+
<i>Salix aurita</i>	Eared Willow	-	-	+
<i>Scorzonerooides autumnalis</i>	Autumn Hawkbit	-	-	+
<i>Sonchus arvensis</i>	Perennial Sowthistle	-	-	+
<i>Trifolium pratense</i>	Red Clover	-	-	+
<i>Trifolium repens</i>	White Clover	-	-	+
<i>Vicia cracca</i>	Tufted Vetch	-	-	+



Monitoring plot 134. The pinpoint frame is located in the center of the picture hidden in the dense vegetation cover to the left of the assistant, photo direction north. Photo no. 5670, 28-08-2019.

Vegetation and ecological parameters in monitoring plot 134.

	17	14	10	13
Height of vegetation in cm	Dwarf shrub	Trees and shrubs below 1 m	Trees and shrubs over 1 m	Free water surface
Cover in m ²	< 1	1	0	0
	Bare soil	Bare sand	Dead wood	
Cover in m ²	0	0	<1	
Light penetration	96	96	96	96
	Inclination	Direction of inclination	Cover of bryophytes in m ²	Cover of lichens in m ²
	4°	SW	< 1	< 1

Species recorded in monitoring plot 134. In the table a species is recorded the first time it is has been recorded in the field, only

International name	Vernacular name	No. of pins	Supplementary species	Additional species
<i>Agrostis capillaris</i>	Common Bent	10	-	-
<i>Holcus lanatus</i>	Yorkshire-fog	8	-	-
<i>Avenella flexuosa</i>	Wavy Hair-grass	6	-	-
<i>Rumex acetosella</i>	Sheep's Sorrel	3	-	-
<i>Cirsium vulgare</i>	Spear Thistle	2	-	-
<i>Molinia caerulea</i>	Purple Moor-grass	2	-	-
<i>Rubus idaeus</i>	Raspberry	2	-	-
<i>Cerastium fontanum</i> subsp. <i>vulgare</i> var. <i>vulgare</i>	Common Mouse-ear	1	-	-
<i>Hypochaeris radicata</i>	Cat's-ear	1	-	-
<i>Poaceae</i> sp.		1	-	-
<i>Ranunculus repens</i>	Creeping Buttercup	1	-	-
<i>Argentina anserina</i>	Silverweed	-	-	+
<i>Calluna vulgaris</i>	Heather	-	-	+
<i>Chamaenerion angustifolium</i>	Fireweed	-	-	+
<i>Cladonia chlorophaea</i> agg.		-	-	+
<i>Crataegus</i> sp.	Hawthorn	-	-	+
<i>Dicranum scoparium</i>	Broom Moss	-	-	+
<i>Dryopteris carthusiana</i>	Narrow Buckler-fern	-	-	+
<i>Dryopteris dilatata</i>	Broad Buckler-fern	-	-	+
<i>Erica tetralix</i>	Cross-leaved Heath	-	-	+
<i>Galium saxatile</i>	Heath Bedstraw	-	-	+
<i>Geranium molle</i>	Dove's foot Crane's-bill	-	-	+
<i>Hypnum cupressiforme/jutlandicum</i>	Plait-moss	-	-	+
<i>Juncus effuses</i>	Common Rush	-	-	+
<i>Luzula multiflora</i>	Heath Wood-rush	-	-	+
<i>Phalaris arundinacea</i>	Canary Grass	-	-	+
<i>Plantago lanceolate</i>	Ribwort Plantain	-	-	+
<i>Plantago major</i>	Greater Plantain	-	-	+
<i>Polytrichum juniperinum</i>	Juniper Haircap	-	-	+
<i>Potentilla erecta</i>	Tormentil	-	-	+
<i>Prunella vulgaris</i>	Selfheal	-	-	+
<i>Rhytidiadelphus squarrosus</i>	Springy Tuff-moss	-	-	+
<i>Rumex obtusifolius</i>	Bitter Dock	-	-	+
<i>Salix repens</i> subsp. <i>repens</i> var. <i>repens</i>	Creeping Willow	-	-	+
<i>Scleropodium purum</i>	Neat Feather-moss	-	-	+
<i>Scorzoneroides autumnalis</i>	Autumn Hawkbit	-	-	+
<i>Senecio sylvaticus</i>	Heath Groundsel	-	-	+
<i>Trifolium repens</i>	White Clover	-	-	+
<i>Viola tricolor</i>	Wild Pansy	-	-	+

MONITORING OF RECOVERING DUNE HEATH AT ØSTERILD 2019

Part 4

The conifer trees in a part of Østerild Klitplantage have been clear-cut to provide room for a national test center for large wind turbines. Before the afforestation' DCE has performed a baseline monitoring in the summer of 2011. DCE has in summer 2019 re-monitored the recovery of the vegetation cover to elucidate the direction and the rate of succession in 76 plots. The afforestation has led to the spread of light-demanding, low-growing vegetation dominated by dwarf shrubs and especially some species of grasses. Besides, in the 76 plots 122 vascular plant taxa have been recorded.

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